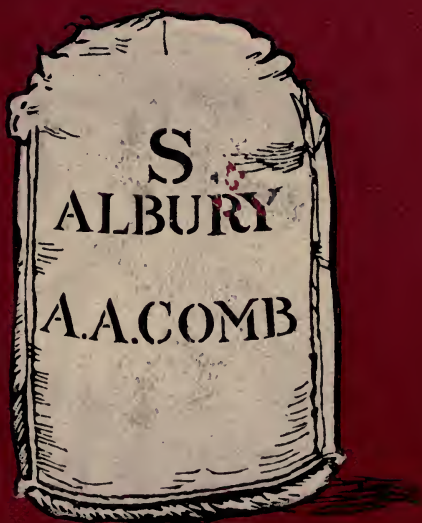


THE SHEEP AND WOOL INDUSTRY OF AUSTRALASIA



HENRY B. SMITH

81-



THE SHEEP AND WOOL
INDUSTRY OF AUSTRALASIA



"THE LEADER" READY FOR THE TRACK.

The strongest beasts carry four bales, equivalent to nearly 1,400 lb. The rest carry two bales each.

THE SHEEP AND WOOL INDUSTRY *of* AUSTRALASIA

A PRACTICAL HANDBOOK FOR
SHEEP FARMERS AND WOOL-CLASSERS

WITH CHAPTERS ON WOOL-
BUYING AND SELLING, SHEEP-
SKINS, AND KINDRED PRODUCTS

By HENRY B. SMITH



THE
SHEEP AND WOOL
INDUSTRY OF
AUSTRALASIA

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TO WHOM
ADDRESS

PREFACE

WHAT a history of fascinating romance surrounds the sheep and wool industry ! It is woven into every department of our national and social life. It is Australia's—and was once the main source of England's—national wealth, for woollen goods at the beginning of the eighteenth century formed two-thirds of England's exports.

The trade in wool has caused great wars and, what is more, has paid for them, which cannot be affirmed by many persons and things that have brought about international bloodshed. For centuries it was the pivot on which much diplomatic and political intrigue revolved, and kings and statesmen thought and dwelt in sheep and wool.

Australia is at the present time the leading sheep and wool-growing country in the world ; it owes this position to the early pioneers who, with indomitable grit and courage, faced the Blacks, the droughts, the loneliness, and other dangers of the Australian bush, that only the stoutest hearts could survive.

At the present time there are numbers of sheep farmers carving out homes in the more unsettled parts of Australia's great continent, and undergoing a good many of the minor disadvantages of their brave pioneer forefathers.

I have often thought how valuable to them would be a well-illustrated and practical handbook, explaining in simple language the most suitable sheep for the various types of country in Australia, and the best methods of marketing wool.

In the following chapters I have endeavoured to provide information useful to both the large station owner and the man grazing a few hundred sheep. Each class of wool-grower will

find in them many interesting points about his sheep and wool, no matter what breed of sheep or type of wool he goes in for.

Many farmers, in addition to wool, have skins, hides, and rabbit-skins of which they wish to dispose, and they will find in these pages valuable information about this class of produce and the best methods of preparing for market.

This volume will be found helpful to country wool and skin buyers, especially in assisting them to arrive at the correct value of the produce they deal in.

I desire to express my thanks to Mr. E. Gooley, of Melbourne, for his kind assistance in many ways with this book ; and to Mr. Sep. G. Jones, of Brisbane ; and Messrs. Smith and Keighley, of Geelong, for valuable help respectively in chapters on Australian Produce and Manufacturing.

I am also greatly indebted to the many gentlemen who kindly provided me with photographs, acknowledgments of which appear in the following pages. My thanks are also due to Messrs. Dalgety & Co., of Sydney, and A. F. Barker, Esq., of Bradford, for allowing me to use illustrations from their publications.

HENRY B. SMITH.

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The Sheep and Wool Industry of Australasia

CHAPTER I

AUSTRALIAN SHEEP HISTORY

Australia's first sheep—Captain McArthur's sheep—Boiling down—Sheep numbers in Australia from 1792 to 1912.

AUSTRALIA is at the present time the leading sheep and wool-producing country in the world, thanks to those hardy old pioneer squatters and a climate and pastures that the fine-woolled Spanish Merino thrive and did better on than those of its native land.

The first sheep were imported into Australia from the Cape of Good Hope about 1788. They were native Cape sheep, and had very fat tails, which would weigh about 10 lb. The fat on the tail was used by the Dutch and Boer farmers as a substitute for butter. Bowman, in giving a description of the Cape sheep, says: "They are of every variety of colour, covered with a strong frizzled hair, with the undergrowth mixed with it." Two or three years later sheep were imported from India. They were miserable, small sheep, growing very light and dark-coloured fleeces of hairy wool. If Australian pastoralists had kept to these types of sheep Australia would not at the present time rank as a country noted for the excellence of its wools. The Spanish Merino is the sheep that has made Australia famous, and the credit for bringing the first sheep of this type into Australia is due to Captain Henry Waterhouse. In the year 1789 he was sent by the authorities

THE SHEEP AND WOOL INDUSTRY

to the Cape to obtain sheep. Captain Waterhouse considered this a disgraceful task for an officer to have to execute. He arrived at the Cape and purchased 32 Spanish Merino sheep from a widow named Gordon, whose late husband had established a small flock, which had been sent to him by the Dutch East India Company. Captain Waterhouse reached Australia with 29 of them, and was offered 15 guineas a head for the lot by Captain McArthur. This



[Photo by Author.]

THE CAPE FAT-TAIL.

Australia's first Sheep.

was declined, as Captain Waterhouse had orders to distribute his small flock amongst several people, Captain McArthur getting three rams and five ewes. Captain McArthur soon noticed that these Spanish sheep of his improved in every way in their new home, the fleeces getting heavier, softer, and finer. In 1803 a sample of his Merino wool was valued at 6s. per lb. in London. Captain McArthur saw great possibilities for Merino sheep in Australia, and he went to London to try and float a company. He wanted £20,000

capital, and he offered his whole flock and pastures, which at this time contained 4,000 sheep. The English capitalists and the Government would not listen to his scheme, as they said that sheep could not live on Australian grasses, and that it would not pay to plant English grasses for them. Captain McArthur was however, not to be set back, and he returned to Sydney to carry out his ideas himself. During his visit to England he obtained from George III's stud at Kew a few Merino sheep which had been given to the King by the King of Spain. Captain McArthur soon got together a flock of Merino sheep, which gave such profitable returns that other keen men were soon attracted by them, and immediately started to follow McArthur's example.

The Rev. Samuel Marsden is another who saw a great future for sheep and wool-growing in Australia. He, like Captain McArthur, obtained the ancestors of his flock from Captain Waterhouse in 1797. In 1804 he had a flock of 1,200 sheep, so this reverend gentleman deserves credit as well as Captain McArthur, as a pioneer in Australian Merino sheep-breeding.

In the year 1792 there were only 105 sheep in Australia. Two years later there were 526. In 1795 there were 830; the following year there were 1,331. In 1799 these had increased to 2,457, while in 1803 there were 11,275 sheep in Australia. In 1821 these had increased to 290,158, and in 1842 the number was 6,312,604. About this time New South Wales pastoralists began to look for more pastures, and Captain McArthur and his brother squatters found plenty of good sheep country in western New South Wales. The first man to start sheep-breeding in Victoria was Edward Henty. Mr. Henty had heard wonderful things about the Victorian pastures from his friend John Batman, who was then in Tasmania. Batman had been told all about this fertile country by Hamilton Hume, who had visited Fort Phillip in 1824. Mr. Henty established a whaling station at Portland Bay. In 1836 a friend of his—a Major Mitchell—told him about some very rich pastures on the banks of the Wannon River. Henty went out and saw them himself, and so discovered the famous "Merino

Downs." He was so excited over his discovery that he galloped his horse over the beautiful plains till it dropped to the ground from exhaustion. The pastoralists of New South Wales soon got to hear of the wonderful pastures in Victoria ; large numbers of them crossed the Murray with their flocks, and settled down on runs in the Western District of Victoria. In 1836 there were only 41,332 sheep in Victoria ; in 1838 the number had increased to 310,946, while two years later the number was 782,283. Things were booming in Victoria at this time. Everybody was going in for sheep-raising. Money was plentiful, and the bullock-drivers who carried the produce to and from the stations and goldfields had champagne in abundance. One writer describes Melbourne as being strewn with champagne bottles.

The boom, however, burst in 1839. Wool began to fall in price. Five years later there was a decided slump, and wool-growing became unprofitable. Everybody wanted to sell out ; sheep that would have brought £4 apiece a few years previously were sold for 2s. and 3s. per head, and many pastoralists were willing to throw in the runs with the sheep. Melbourne had 280 bankruptcies in less than two years, and gentlemen with 6,000 sheep could not get credit for ordinary rations. Boiling down was commenced at this time, as tallow was about £28 per ton, say 3d. per lb. The average sheep would yield about 30 lb. of tallow, besides the skin and bones, both of which were saleable. This boiling down saved a large number of the squatters from bankruptcy. In 1842 there were 1,404,333 sheep in Victoria. In 1844 these had only increased to 1,860,912, as boiling down was still going on. In 1845 boiling down ceased, as prices for wool began to get better ; in 1847 there were 2,966,992 sheep in the State, and two years later this number had nearly doubled. In 1851 there were 6,032,783 sheep in Victoria. Conditions changed very much in Victoria when the gold rushes set in. Tradesmen, miners, and others flocked to the country, and when the gold fever was over they desired to go on to the land, but found that the pick of the country was held by the early squatters, and each side became very bitter towards the other. The new-comers, however, got a

Land Bill passed in 1877, while another was passed by the Federal Government in 1910. Victoria has lost most of its large Merino runs, and what are left will soon go the way of the others. Most Victorian sheep-breeders are going in for the Cross-bred sheep owing to the great demand for large carcase sheep for the frozen mutton trade.

Australia has a lot to thank Captain McArthur for ; he had many difficulties placed in his way. He was laughed to scorn by those conservative London merchants who wanted something safer to invest their money in than Australian sheep-runs ; but like most strong men he was not deterred by their opinions. He had his own ideas, and carried them out successfully.

In 1905-6, 717,384 carcases of frozen mutton were shipped from Australia to other countries, the value of which was £466,301 ; while in 1909-10 there were 1,100,292 carcases shipped, valued at £687,682.

About 74 per cent. of the sheep in Australia at the present time (1913) are Merino ; the remaining 26 per cent. consisting of cross-bred and a few pure-bred English long-woolled sheep. Australasian sheep numbers for the years 1909-12 are given in the following table :—

	1912.	1911.	1910.	1909.
New South Wales ...	39,436,118	45,032,022	45,825,308	46,194,178
Victoria	11,892,224	13,857,804	12,937,983	12,937,983
Queensland	20,248,580	20,387,838	29,153,239	19,593,791
South Australia ...	5,481,489	6,267,477	6,432,038	6,898,450
Western Australia ...	4,593,458	5,425,469	5,157,658	4,692,419
Tasmania	1,744,209	1,788,310	1,735,000	1,728,053
Northern Territory ...	72,574	—	—	—
Commonwealth Total...	83,468,652	92,758,920	92,241,226	92,044,874
New Zealand	23,750,153	24,269,620	23,792,947	23,480,707
Australasia Total ...	107,218,805	117,028,540	116,034,173	115,525,581

The value of the 1910-12 Australian wool clip was £24,642,643.

CHAPTER II

SHEEP AND LOCALITIES

Merino and cross-bred sheep—Countries they are best adapted for.

FIRST let us take the Australian Merino, the sheep that has made Australian wool famous and sought after by almost every nation in the world. There are several types of Merino sheep, such as the wrinkly American Vermont, and the large-framed plain-bodied type, which is the most fashionable Merino at the present time. We also have the fine-woolled type from the Mudgee District of New South Wales, and Victoria. Tasmania is also noted for its fine-woolled sheep. In South Australia the type most used is the strong, bold type of Merino, growing a wool of great length, the quality being 58's to 60's. Australia being such a large continent naturally has several distinct types of country, varying from the hot, dry, sandy plain country of western New South Wales and northern South Australia to the luxuriant pastures of the Western District of Victoria, the south-eastern portion of South Australia and Tasmania. Now each of these localities requires a sheep suitable for them, and the grasses or bushes which grow there. The fine-wool Merino is largely used in the Mudgee District of New South Wales, and the country there is suitable for sheep growing that class of wool. The wool grown in the Mudgee District is fairly heavy in condition.

The Western District of Victoria is another district where this fine wool grows to perfection ; 160's have been spun from Merino wool grown at Ercildoune in the Western District of Victoria, and it would be hard to find any other country in the world that can



AUSTRALIAN-VERMONT MERINO.
Growing Black-tipped and Heavy-conditioned Wool.

produce a wool of that quality. It has a great length of staple combined with exceptional fineness—an unusual thing in fine wools, as they are usually very short in the staple.

The Victoria Western District wools are very light in condition and clean to the tip, possessing a very even crimp, and last, but not least, they give as high a percentage of clean scoured fine wool as that grown in any other country in the world. Victorian Western District wool is mostly purchased by the Americans, who pay enormous prices for it. Tasmania is one of the noted sheep-breeding centres in Australasia, and Merino studs bred there bring very high prices at the sheep sales in Melbourne and Sydney.

The wool from the Tasmanian Merino resembles that grown in the Western District of Victoria. It is, however, slightly heavier in condition. We will now come to the back country, where they have great heat in the summer and numerous dust-storms, during which the fine red sandy dust is blown with great force against anything that happens to be in the path of the storm. I have seen the fine-woolled type of Merino in this dry portion of western New South Wales and similar places, but I do not consider it a profitable wool to grow in these localities, for the following reasons. You will notice that fine Merino wool possesses a very decided and closely knitted crimp, and it is in most cases a wool that has a fairly short staple. Take this fine-fibred wool in the midst of summer, with a blazing sun shining down upon it; the fine, delicate fibre cannot resist it. It becomes perished and open, and after the first dust-storm it will be noticed that the sand has been blown right through the wool, down to the skin, especially on the back of the sheep. These fine crimped fibres hold the sand firmly. Once in, it has practically no chance of getting out again, and the wool becomes perished, mushy, and lifeless. In some cases the wool on the centre of the sheep's back loses its staple altogether. The young sheep, such as the Hoggets and four-tooth wethers, resist the heat and sand better than any other sheep in the flock, but when you look at the breeding ewes you will see what poor fleeces these fine-woolled sheep grow in localities such as I have mentioned. In a good many instances



THE AUSTRALIAN MERINO.

Bred by Messrs. F. S. Falkiner & Sons, Ltd., Boonoke, N.S.W., and sold to Canobar Station for 1,600 guineas, 1913.

the back-country pastoralist has his wool scoured and placed on the market in that state. This fine wool, if well scoured, will very often bring record prices and beat scoured wool of the strong, bold type of Merino by 2d. or 3d. per lb., and a few pastoralists who grow the fine wool are inclined to think it the best ; but financially it is not so, because the clean scoured yield from fine wool in the hot sandy country is very low ; in some cases it will lose 65 per cent. of its weight. The strong-woolled sheep will give a much heavier fleece of higher yielding wool than that of the fine-woolled type of Merino. While employed as wool-classer on a station in the Broken Hill District of New South Wales, where the flock was of the fine-woolled type Merino, I noticed that all the bulky, brightest, and most profitable fleeces were the coarsest. By this I mean they were about the quality of the average strong Merino wool. This and several other instances proved to me that the strong wool was better able to stand the severe heat and dust-storms than the fine, and gave the pastoralist the best return per head for wool and carcase.

CROSS-BRED SHEEP.

We will now come to the Cross-bred sheep—a type which is rapidly gaining ground in Australia, especially in districts where large estates have been cut up and the land thrown open to farmers, who mostly go in for this type on account of the large carcase they possess. The percentage of cross-bred wool was 22 per cent. in 1907–8 ; at the present time it is 26 per cent., so a large increase has occurred in this variety. Cross-bred sheep require fairly good country with plenty of water. For this reason they thrive best in districts where the rainfall is plentiful. Another thing you must have is very good fencing, as cross-bred sheep will get over any low parts in a fence, or jump through if the rails are too far apart or the wires too loose. All breeders of these sheep know that it is very hard to breed an even type, as they throw in all directions, though mostly resembling the sire. Some Victorian and New Zealand breeders claim to have established a distinct



[Photo kindly lent by Thos. Muirhead, Esq.]

THE TASMANIAN MERINO.

Bred by the late James Gibson, Belle Vue, Tasmania, and sold to Señor Miguel Bidart, Uruguay, for 1,000 guineas.

type of fine Cross-bred sheep, growing a wool of 56's to 58's quality. I consider this fine Cross-bred sheep a splendid type for country that is too heavy and damp for Merinoes. This type is not so subject to footrot as the Merino. In starting to breed a line of fine Cross-bred sheep, I would first procure a line of Merino ewes of the large-framed, strong-woolled type, such as I mentioned in a previous chapter, as being best suited to the dry sandy districts. The next thing to do would be to procure the necessary number—say 2 per cent.—of well-bred Lincoln rams. Care must be taken in selecting a ram. To get the best results you must procure one possessing a large carcase and growing lustrous wool of great length, with plenty of character in it, the quality of the wool being from 36's to 40's. The progeny of this couple would be a half-bred, the quality of the wool being from 48's to 50's, any very coarse-woolled sheep being culled out before going any farther. You would always get a proportion of sheep that are not suitable, and as it is impossible to get an even type from two distinct breeds, you must obtain the type you desire by culling any that greatly differ from it. To produce a large carcase I would use the Lincoln ram again. You would then have the Lincoln strain well developed in the progeny, which would have a dense and heavy fleece of combing wool of great length, the quality of which would be about 46's, still remembering to cull away any that are too coarse. On this progeny I would introduce a Merino ram of the large, strong-woolled type that I have mentioned earlier. The progeny of these latter types would give you the fine Cross-bred sheep. This sheep would possess more of the Merino type of wool with a large carcase, which would resemble the Lincoln more than the Merino. The wool of these sheep will be very light in condition, possessing a long length of staple, the quality being 56's. or thereabouts, which is a shade coarser than Comeback wool, the quality of which is 58's. On account of the high yielding qualities of this wool, it is mostly purchased by the Americans, who pay very high prices for it. This type of wool has brought as high as 17d. per lb. American importers of wool have to pay a duty of 5½d.



NEW ZEALAND CORRIEDALE.

A fine Cross-bred type of sheep growing wool of 56's and 58's quality, bred by C. H. Ensor, Esq.

per lb. on greasy wool going into their country, consequently they only purchase the lightest and highest-yielding wools, as they do not want to pay that duty on grease and dirt.

If a finer or coarser type of wool than the quality I have mentioned is required, you could obtain the fine quality Comeback by using the Merino ram again. For the coarser quality wool you would, of course, use the Lincoln ram. The best cross for the average farmer, who looks upon his sheep more as a mutton-producer than a wool-grower, would be the progeny of the Lincoln ram and the Merino ewe. I do not think it advisable for him to go to all the trouble to obtain the fine Cross-bred type because his flock is so small and it changes hands so often. A Leicester ram could be used in the place of the Lincoln, and it would produce a finer and a lighter conditioned wool, which would bring a higher price per lb. than that of the Lincoln cross, but what the Leicester cross would gain in the price per lb. would not compensate for the extra weight of the Lincoln cross fleece and the larger-framed progeny. The Leicester cross has a small head, and it is advisable to use this type of sire on small-framed ewes, as at lambing time the head of the Lincoln progeny being so large is apt to cause small-framed ewes a lot of trouble and loss, as a large number of the lambs are choked during lambing.

CHAPTER III

ENGLISH SHEEP

Lincoln—Leicester—Border Leicester—Romney Marsh—Shropshire—
Southdown—Hampshire Down—Suffolk.

A FEW particulars of the English breeds of long wools and others, which are well known and bred in Australia, will be interesting and useful to sheep farmers.

First let us take the Lincoln. This is one of the oldest and best known of all the English breeds. The Lincoln came into favour in England about 1870, and at this time some very high prices were paid for studs. We have several pure Lincoln studs in Australia at the present time. The Lincoln is a large-framed, long-woolled sheep, which is very prolific, and the lambs mature early. To get the best results, they must be kept on good pastures, as they do not thrive if kept on poor and dry country. They grow a heavy fleece of long-stapled wool, the spinning quality of which is from 36's to 40's. The average Lincoln will cut from 12 to 15 lb. of wool, which fluctuates a lot in price, but when prices are good it is one of the most profitable wools one can grow. If kept on clean country this wool is very lustrous. The Lincoln is an excellent sire for crossing with robust Merino or fine Cross-bred ewes. Mr. W. Berry, the President of the Lincoln Breeders' Association, Masterton, Wairarapa, New Zealand, says that in his opinion the head of a Lincoln is the surest index of breeding, character, and strength. The head should be full from the nose to the eyes, and well set up, with a good slope to the shoulders. The ears should be soft, without being too low down. Black spots on the



LINCOLN.

ears were a characteristic of the breed, and it was good to see them. The shoulders should be well set up, although it was not good to have the head and neck too thick, as it made trouble at lambing time. It was better to have a moderate length of loin in view of the weight of wool a Lincoln had to carry. He lays particular stress upon the importance of good bone. When judging an undeveloped sheep, the first consideration was the head, and, second to that, bone. If the wool of a sheep under the jaw was soft, it was a sure indication that it was soft all over. The hair on the face and legs was of great importance. He liked to see it "downy," and if inclined to show darkness it was a sign of constitution and quality, although this could be overdone, as it was quite possible to rear a black sheep by sticking to sheep inclined to darkness. He preferred a medium lock, but it was of the utmost importance to have good wool on the back. The back wool had to stand rain and sun, and if not strong would become light and fuzzy. The wool should be strong near the shins and well set on.

LEICESTER SHEEP.

The Leicester is another of the British long-woolled sheep well known to the Australian pastoralist. This breed possesses a good carcase, with a small head. They are very prolific. Their wool is very light-conditioned, usually possessing great lustre and length of staple, the quality being about 40's. The Leicester makes an excellent cross with very small-framed Merino or Comeback ewes, which would have great trouble at lambing time if mated with a sire possessing a large head, such as the Lincoln. The Leicester does not cut as heavy a fleece as the Lincoln, but it is lighter-conditioned and more lustrous. In fact, Leicester wool is one of the most lustrous wools grown. This breed owes its present high standard to Robert Bakewell, of Dishley, Leicestershire, England. In season 1910-11 a Cross-bred wool, the result of Leicester ram and Merino ewe, topped the London market for Cross-bred wools.



LEICESTER.



BORDER LEICESTER.

THE SHEEP AND WOOL INDUSTRY

BORDER LEICESTER SHEEP.

There are contradictory reports as to the origin of the above breed, as writers on English breeds of sheep give them a different origin. A good many say that the original Leicester was crossed with the Cheviots—a breed of sheep used greatly in the North of England and in Scotland—while others contradict this. A well-bred Border Leicester is a fine-boned sheep, possessing a small head, with a broad chest and good round quarters. The wool is very lustrous and has a long staple. The spinning quality is from 40's to 46's. The average Border Leicester will cut about 12 lb. of wool. They are excellent sheep for crossing with small-framed Merino or Comeback ewes, and are best suited for country which has fairly good pastures. The progeny will grow very bright, light-conditioned cross-bred wool, such as is bought by the Americans.

ROMNEY MARSH SHEEP.

The Romney Marsh is another of the well-known English breeds of sheep. These sheep have been bred for years in the Romney Marsh, England—damp, poor country, facing the sea-coast and exposed to all its violent gales. Consequently they have developed into a very hardy breed of sheep. One of their noted points is that they resist footrot better than any other breed of sheep yet known, and will thrive on poor, damp country, where many another type would quickly perish. The quality of this wool is from 40's to 50's. When crossed with the Merino the result is a long-stapled, bright, fine-woolled, Cross-bred sheep, possessing a good carcase, and being very hardy—a suitable sheep in every way for the farmer whose pastures are damp. There are several stud flocks of Romney sheep in the Commonwealth and New Zealand, where they claim to have improved on the best English types of these sheep, as Mr. Short's Romney exhibits bred in New Zealand carried off most of the important events against the best English-bred types exhibited at the Argentine Show in 1910.



ROMNEY MARSH.

SHROPSHIRE SHEEP.

The above type is well known in Australia, and is one of the English breeds of short-woolled sheep. The Shropshire is noted for its early maturity, and is an excellent mutton sheep. Shropshire lambs or Shropshire cross lambs are second to none, and they are very payable sheep to breed, as they are mostly purchased by the export trade. Where possible, I think the Shropshire cross lambs should be sold, because they grow a very inferior wool, with no character, and a short length of staple, besides being very harsh and wiry.

These sheep have black points and nose. The quality of pure Shropshire wool is from 56's to 58's. The Shropshire sheep have small heads, and are suitable for crossing with small-framed ewes.

SOUTHDOWN SHEEP.

The Southdown is also one of the English short-woolled variety. They are noted far and wide for the quality of their mutton, the meat being very fine-grained, and having a flavour said to be unequalled by any other breed of English sheep. Southdowns are polled sheep possessing black feet and faces. They mature very early and are most prolific, as fully 40 per cent. of pure-bred Southdown ewes have twin lambs. They are hardy sheep, and will thrive almost anywhere. They are not good as wool-growers, the fleece being very light, possessing a spinning quality between 58's and 60's.

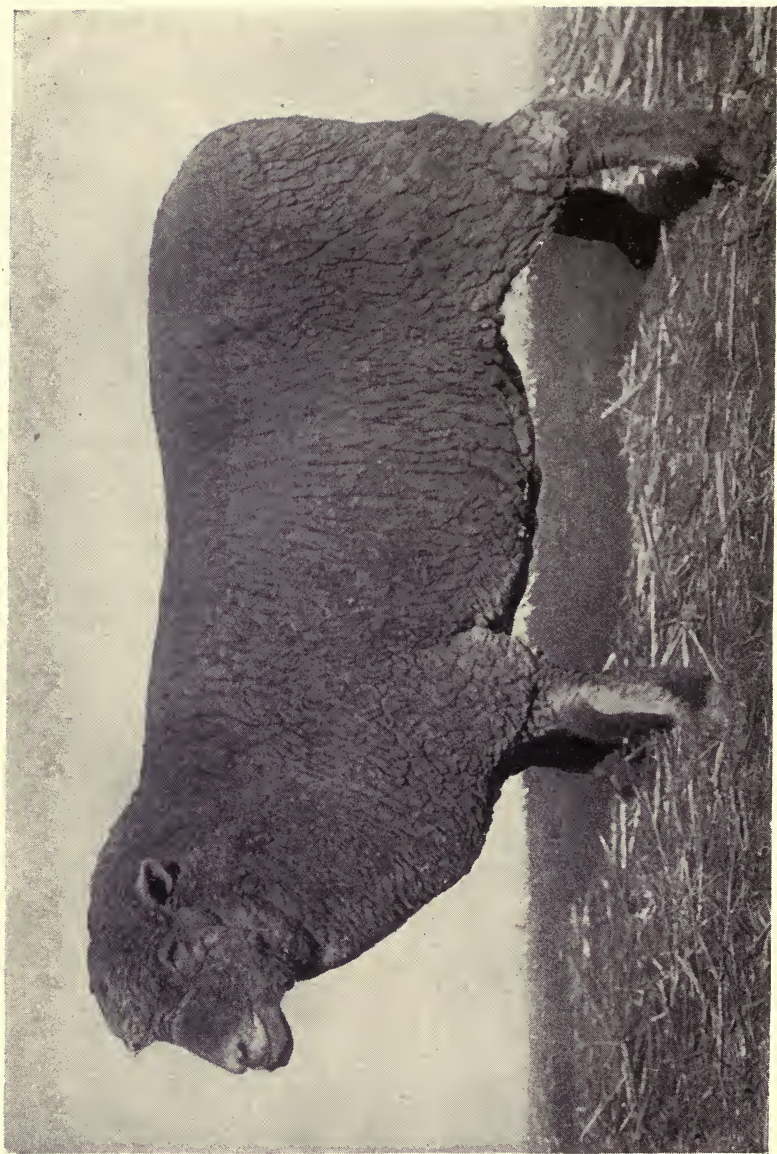
HAMPSHIRE DOWN SHEEP.

The above breed of English sheep is not so well known as the former types I have mentioned. They first made their appearance in England about 1860. They are good, hardy sheep, able to withstand the cold without any great loss of flesh, and they do well on any of the root crops which farmers in this country grow for their stock during the winter months. The lambs mature early, and in the spring will weigh between 40 and 45 lb. dead weight.



[Photo kindly lent by "Pastoralists Review,"

SHROPSHIRE.



SOUTHDOWN.

The face and legs are of a deep brown colour and the wool varies from 50's to 56's in quality, and has a fair length of staple.

The above sheep are suitable for poor, hilly country, where they can, if necessary, be fed on mangels, etc., during the worst of the winter months.

SUFFOLK SHEEP.

I have seen the above breed of English sheep exhibited at several of our country and town Shows. They resemble very much the Hampshire Down, and would be a sheep suitable for the same class of country that I have mentioned as best suited for the Hampshire Down.

They are very prolific and are noted for the fine quality of their mutton. The wool is a shade finer than that of the Hampshire Down, the spinning quality being about 56's or strong Comeback wool. The head of this sheep should be without horns.

CHAPTER IV

SHEEP SELECTION

Method of selecting or classing sheep

SHEEP classing is a profession that requires a good deal of knowledge only to be obtained by practical experience. A good many sheep classers, who are excellent judges of sheep from a carcass point of view, are considerably handicapped by their scant knowledge of wool. To be a thoroughly efficient classer one must thoroughly understand and be able to recognize the various qualities and types of wool. The average sheep farmer can, however, with a little judgment, class his own sheep : it would be too expensive for him to think of employing an expert for small flocks.

The main object of classing is to remove any faulty sheep, or those of a type other than the pastoralist wishes to breed. Sheep having any of the following defects should be culled out of the breeding sheep :—

1. All sheep having kempy hairs—that is, long, coarse, white hairs on the face and under the fore-legs and thighs. The wool on sheep of this class runs very coarse at the britch, and is full of kempy hairs. • These hairs very often grow longer than the wool. In some cases they cover the whole of the carcass. The wool is of very low value, and on no account should a kempy fleece be placed in a bale with others.

2. Any very small and delicate sheep.

3. Sheep growing very light, mushy wool which lacks density ; also any sheep growing hard, black-tipped wool of the Vermont type.

4. All leggy sheep—that is, sheep with long legs and a carcase not in proportion to them.

5. Patchy-woolled sheep. These sheep may have excellent wool on the shoulder and brisket, while it will fall away in length and density about the extremities and belly.

6. All hollow, or hump-backed, and other deformed sheep.

7. Sheep growing patches of black wool.

When classing Merino sheep some classers will reject a ram because his wool is rather strong, though otherwise he is a perfect sheep. I think this is a great mistake. A sire should be of a bold, masculine type ; why not allow a little of it in the wool ?

The American Vermont Merino is a very wrinkly type, the folds extending all over the carcase, and growing a weighty fleece of very heavy-conditioned and low-yielding wool. This breed is fast going out of favour with Australian sheep-breeders. A typical well-bred Merino ram should be short and thick in the neck, and free from dewlap. The carcase should be round, and free from folds or wrinkles on the body. The back should be even and straight, and not too long. The legs should be on the short side, with wool down to the hoofs. He should have plenty of width across the shoulders and loins. The horns should not be too close to the head, the first curve being not less than one inch from the cheek. Poley rams are rejected, as they lack masculinity. The head should be in proportion to the body and covered with wool. The face should be fairly broad with a good width between the eyes. The wool around the eyes should be clipped occasionally, so that it will not interfere with the sheep's sight. The wool grown by the ram is most important. It should have a long, sound staple, containing plenty of clean, healthy yolk, and it should not be dingy or discoloured. The ends of the staples should be free from black, hard tips. The

staples should be broad, and packed densely together. The wool should be fairly even in length and quality all over the carcase. The shoulder wool should be examined first, and taken as a standard. The wool on the remaining portions of the body should be as like it as possible in every way. A ram with wool that falls off very much in length and density about the extremities and belly should always be rejected.

CHAPTER V

FAT LAMBS

Suitable breeds for fat lambs.

SOME time ago experiments were made at the experimental farm at Moumahaki, in the Wanganui District of New Zealand, as to the best crosses for producing fat lambs; and the results, which are now available, cannot fail to be of general interest.

During each of the four seasons 1905-09 about 200 ewes, principally Romney-Lincoln cross, were divided into four lots and mated on or about March 5th to pure-bred Border Leicester, Shropshire, and Southdown rams. The average returns for the four seasons work out as follows:—

BORDER LEICESTER.

Percentage of lambs	...	...	...	...	115
Fat at first draft	...	...	...	...	64·0 per cent.
Average live weight	...	...	...	...	77·5 lb.
Average dead weight	...	...	...	...	38·3 lb.
Percentage of meat to live weight	...	...	...	...	46·8

SHROPSHIRE.

Percentage of lambs	...	...	...	...	129
Fat at first draft	...	...	...	...	68·07 per cent.
Average live weight	...	...	...	...	78·5 lb.
Average dead weight	...	...	...	...	37·1 lb.
Percentage of meat to live weight	...	...	...	...	47·2.

SOUTHDOWN.

Percentage of lambs	...	...	...	...	116
Fat at first draft	...	...	...	...	74·42 per cent.
Average live weight	...	...	...	...	76·5 lb.
Average dead weight	...	...	...	...	37·1 lb.
Percentage of meat to live weight	...	...	...	...	48·30

The above comparison shows that the Southdown cross came out on top with 74·42 per cent. of its lambs fat at the first drafting, while the dead weights averaged 37·1 lb. per carcase. The Shropshire cross comes next with 68·07 per cent. of its lambs fat at first drafting; but the Border Leicester cross shows a smaller average weight per carcase. The latter breed would, perhaps, take second place for the purpose in view.

The freezing companies report that: "The Southdown cross lambs are invariably the best freezing carcasses, being also excellent in colour and conformation. The English Leicester cross is a good freezing lamb, but it is not of the same bright colour as the Southdown. The Shropshire Down cross is also a good class of freezing lamb, will cut well, but is a shade coarser than the Southdown and does not exhibit the same quality. The Border Leicester cross is a rather coarse type of lamb, heavy carcase of tallowy appearance, and will cut fat."

In New South Wales a similar experiment to find out the most profitable types of sheep was tried at the Glen Innes experimental farm. Several crosses were tried. The most profitable cross was that of the Lincoln-Merino. The resulting sheep weighed 124 lb., and cut 15 lb. 12 oz. of wool, as against the Dorset-Merino cross, with 136 lb. weight and 9 lb. 7 oz. of wool. Border Leicester-Merino cross weighed 129 lb. with 11 lb. 12 oz. of wool. The Down cross was not a success. The manager of the farm would only care to recommend the above crosses for small holdings with artificial or cultivated pastures.

Several of our well-known export butchers wrote the following article, entitled "A Warning and Advice to Fat Lamb Breeders." It appeared in *The Age* of November 7, 1911.

A WARNING AND ADVICE TO FAT-LAMB BREEDERS.

TO THE EDITOR OF *The Age*.

SIR,—In the interests of the export lamb trade, and especially towards improving the reputation of and demand for Australian lamb in the English market, and also in the interests of those farmers and pastoralists who regularly go in for breeding and fattening lambs for export, we, as the largest exporters in

the trade in Victoria, and also doing a considerable business in New South Wales and South Australia, think it only right and our duty to sound a word of warning, and at the same time give a little advice to breeders.

In the early years of the business the export lamb trade in Australia was largely built up and made successful by breeders using pure Shropshire rams, the crosses from which we have proved by experience are eminently fitted for the best English trade. Maturing quicker than most other crosses, the Shrop. lamb at the earliest possible age is good in the most valuable joints—back, loin, and leg—and running to meat rather than fat, gives better results dressed dead weight in proportion to live weight than any other cross we know of. For some years the majority of breeders followed the right track, and bred the Shrop. cross; but the last two or three seasons, owing largely, we believe, to the rise in Cross-bred wool, the majority has swung the other way, and tried to breed and export lamb got by sires of other breeds, with varying results, trending in the wrong direction. The consequence is that we now find it impossible to get as big a proportion of lambs fit for the best home trade as formerly, these other crosses compelling a larger number of rejects than is usual from the Shrop., and those accepted not being equal for our purposes to that cross.

And, as regards seasons, our experience is that the Shrop. cross in a bad or indifferent season will come out even better in proportion than in a good one, when compared with other breeds, as regards percentage fit for export. So we must warn breeders that they are on the wrong track in dropping the Shrop., and our advice to them, if they want to help us to expand this trade and make Australian lamb more popular and secure a better price in the old country, and therefore more payable to the breeder, is to go in again largely for the Shrop. sire. Not for a moment do we want to disparage other breeds; all have their good points for their own special purposes, but we say unhesitatingly that throughout Australia for the export lamb trade we have found the Shrop. cross the best.

Breeders must remember that the export trade can never be fostered and developed as it should be by their trying to make the home trade a dumping ground for simply unsuitable stock, bred for wool as the first and main consideration, and that if they value this trade and desire to increase it to the immensity we believe possible, and win for it a reputation and value equal to New Zealand, then they must cater for the trade and breed a lamb suitable for the best English customer.

. Yours etc.,

W. ANGLISS & Co.,
JOHN COOKE & Co.,
THOS. BORTHWICK & SONS, LTD.,
SIMS, COOPER, & Co.

MELBOURNE, 6th November.



AN AUSTRALIAN SHEARING SHED.

CHAPTER VI

SHEARING

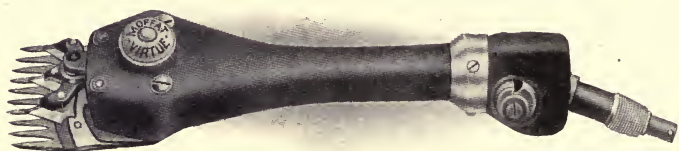
Shearing machine — Drafting — Dipping — Shearer's working hours — Agreement.

SHEARING is always a very busy time on a sheep station. The manager has to see that the tanks about the shed have plenty of water in them, and that the cook is supplied with plenty of firewood. Shearers and shed hands have to be engaged, and rations, woolpacks, twine, machinery, oils, combs, cutters, and numerous other items which are necessary at a machine shearing, have to be ordered.

Most of the shearing in Australasia is done by machinery. The shearing machine works on the horse-clipper principle—a cutter with three teeth running from side to side over a flat comb. The handpiece, as the machine itself is called, is driven by a small connecting rod, which is again driven from the main shaft overhead. This connecting rod has three joints in it. The first is at the end connected with the main shaft. The next joint is about two feet or so from the handpiece, and it enables the shearer to move the handpiece up and down freely. The third joint is in the handpiece of the machine itself. It is called an elbow-joint, as the shearer can move the handpiece any way he desires. The main shafting is driven by either a steam or an oil engine, though some of the later machines are driven by electricity. In the electrical-driven machines each connecting rod, instead of being connected with the ordinary revolving shafting above, has a small electric motor at the top of the rod which supplies the driving

power. The electricity is generated by an electric dynamo which is usually driven by an oil engine. The shearer can switch the current on or off his own machine as he desires. Each shed employs an expert, who sharpens the shearers' combs and cutters and looks after the machinery.

A good shearer will shear over 100 average sheep in eight hours without any great trouble. A lot depends on the type of sheep that is shorn. I have seen a man shear 215 light-woolled Cross-breds in eight hours, and I have heard of instances where fast shearers have bettered this considerably. On a station the first sheep that are usually shorn are the ration sheep. These are the sheep that are to be killed for household and shearers' use. After them the rams are generally shorn, followed by all the dry sheep. These are sheep without



SHEARING MACHINE HANDPIECE.

lambs, such as hoggets, wethers, and dry ewes. The lambs and ewes are then shorn. The former are drafted from their mothers, and a mob of each is shorn alternately, the shorn lambs being then returned to their shorn mothers.

Two shearers generally have one pen to catch their sheep from. They are called catching pens. When the shearer has shorn the sheep, he lets it go into another pen, which is known as a counting-out pen, because it is in these pens that the overseer counts the number of sheep each shearer has shorn. Shearers work eight hours each day. They start at 6 o'clock in the morning, if the light permits, and work till 8 o'clock. The breakfast-hour is from 8 to 9. They then work till 10.20, when they have 20 minutes' rest, or "smoke ho" as it is called, in a shed. Starting at 10.40, they work till

12 o'clock Twelve o'clock till 1 o'clock is dinner-time. They then work from 1 o'clock to 2.20, when another "smoke ho" is due. Work is again resumed at 2.40 and continued till



[Photo by Author.]

FIRST POSITION: TAKING OFF THE BELLY WOOL.

4 o'clock, when lunch is passed round. This takes half an hour, when work is again started and kept on till 6 o'clock if the light permits. The longest run is two hours—from 6 till

8 o'clock in the morning. On Saturday the work ceases at 12 o'clock in most sheds.

The shearer, when he first takes a sheep from the catching pen, takes off all the belly wool, which is thrown out into the



[Photo by Author.]

SECOND POSITION : TRIMMING INSIDE OF LEGS AND OPENING UP WOOL
ON LEFT HIND LEG.

centre of the board. He then trims the inside of the hind legs and crutch, and takes the wool off the outside of the left leg, and removes the top-knot—a small cap of fuzzy noily wool which grows on the top of the sheep's head. The machine is

then driven up the front of the neck several times till the neck wool is well opened up. The front legs are then trimmed, and the sheep turned over on its right side. The shearer now gets in a long blow with the machine, running from the britch end to the top of the neck, till he has got the sheep shorn to the centre of the back. He then holds the sheep up till it is in



[Photo by Author.]

THIRD POSITION : OPENING UP NECK WOOL.

a sitting position, and trims the face, and in a number of strokes running from the back to the brisket he takes the wool off, finishing on the right-hand quarter.

When he has shorn the sheep he lets it go into his counting-out pen, where the overseer counts the number he has shorn every run. The fleece is taken away as soon as the shearer has finished a sheep, so that his stand will be clean and ready

for him to start on another sheep. The boy who removes the fleece is called a picker-up. The picker-up should take hold of the fleece by the two ends of the britch, and draw it towards him in folds till he is able to lift it, remembering to keep a firm hold of the ends of the britch. When throwing the fleece on the rolling table, he should throw it towards the



[Photo by Author.]

FOURTH POSITION: THE LONG BLOW.

opposite end of the table, releasing his hold of all parts except the two ends of the britch. If he lets go his hold of this portion, the fleece will fall on to the table in a tangled-up bundle. In throwing Merino fleeces on to the rolling tables, I have noticed boys throw them with a sharp jerk, with the result that the fleece has broken in two, the britch end still

remaining in the boy's hand, while the other part of the fleece has fallen on to the table in a tangled mass, which takes the wool rollers some considerable time to straighten out. Cross-bred fleeces hold together much better than the Merinoes, and can be thrown on to the rolling tables much more easily. A



[Photo by Author.]

FIFTH POSITION: FINISHING.

drafting yard near the shed is a necessity, so that sheep, especially Cross-bred, can be drafted in their respective qualities, such as fine, medium, and coarse-woolled sheep.

A few weeks after shearing—say four weeks for Cross-bred and six weeks for Merino—the sheep are usually dipped in an arsenic or other dip. This is done to kill all the parasites,

such as tick, the maggot fly, etc. The dip is usually put up in powder form, a quantity of water being added according to the directions which the makers supply. Dipping improves the wool and has a beneficial effect on the sheep also. It is now made compulsory by law for Victorian sheep-breeders to dip their flocks once in twelve months.

SHEARER'S AGREEMENT. NOT FOUND.

In accordance with the award of the Commonwealth Court of Conciliation and Arbitration, dated 27th October, 1911.

Agreement made the *Twelfth* day of *October*, 1913, between *Robert Hill* (hereinafter called the "employer") and *John Brown* of *Melbourne* (hereinafter called the "employee") :—

1. The employee will shear with all reasonable despatch and in a good and workmanlike manner all the sheep belonging to *Glenisla* station which the employer shall require him to shear at the shearing beginning on the *Twenty-first* day of *October*, 1913.

2. The total number of sheep to be shorn at the shearing will not be less than 20,000, and not more than 30,000.

3. The employer will be ready to commence shearing on the *Twenty-first* day of *October*, 1913, and the employee will be at the station ready to begin shearing by that date, and the employer will keep the employee fully supplied with sheep till the completion of the shearing, unless prevented by any unforeseen cause or causes. But the employer need not pen sheep for shearing which, in his honest opinion, are too wet for shearing.

4. The *SHEARERS*

will provide their own cook and rations or will provide their own rations in a joint mess.

If a joint mess—

The employees at the shearing not "found" are to have a joint mess with those "found."

A cook will be provided by the members of the joint mess and (subject to clause 11 of the award) the employer will pay him at the same rate per head for the members to be "found" by him as those not to be "found" by him agree to pay to the cook for themselves; and the rations provided by the employer for employees to be found by him will be on the same scale as to quality and quantity as the rations provided for those not to be so found.

If a cook be not provided (and ready at hand to act as cook) by the members of the mess before the hour fixed for the shearing to begin, the employer may (as agent for the members of the joint mess) appoint a cook (fixing the rate per head) to act (at the option of the employer) either during the shearing or until the members of the mess provide a cook.

Here specify
name of station
or stations.

Here insert the classes
of employees who are not
found in cook and rations.

The term "employees at the shearing" includes the overseer, woolclassers, experts, grinders, engine-drivers, or other persons, even if their meals are by direction of the employer or of the overseer to be served in a separate room.

5. The employee will not absent himself from his work during the hours of work except in the case of his illness or except as hereinafter provided.

He may be discharged by the employer for any breach of this Agreement, or he may leave in consequence of accident, sickness, or other urgent necessity, or with the permission of the employer as hereinafter provided ; but in case of discharge or of leaving as aforesaid the employer will pay him in full for all sheep shorn by him after deducting any sums for which the employee is liable to the employer under this Agreement, and also 15s. per week, or any other rate per week that the majority of the members not "found" of the mess remaining fix for his share of the mess to the date of leaving, and the amount deducted shall be placed to the credit of the mess account.

Permission to leave will not be given to a shearer without the consent of the majority of the shearers and woolpressers remaining.

6. (a) The employer will provide all the shearing machines required and suitable machinery in good order, and competent and sufficient persons to keep the machines in order, and to work the machinery.

(b) For every six hand shearers employed the employer will provide one grindstone at least.

7. In case the employee is stopped from shearing through breakage of the machinery, except from any cause over which the employer has not any control, the employer will pay to the employee at the rate of ten shillings per day for every day or part of a day beyond one hour and twenty minutes of working time, so long as there are sheep fit to shear.

But the employer may on or after the expiration of one week from the beginning of the stoppage (unless in the meantime this Agreement be terminated by mutual consent) terminate the Agreement of his own will.

8. The employer will cause the total tally of each day to be posted on or before the next day on a tally board in the shed, and will daily supply to the employee in writing his tally for the day.

9. The employer will pay the employee at the following rates :—

For flock sheep (wethers, ewes, lambs), 24s. per 100.

For rams over six months old, other than special stud rams ; and for ram stags, 48s. per 100.

For stud ewes and their lambs, other than special studs, 30s. per 100.

"Ram stags" mean rams which have been castrated after they have attained 18 months.

"Stud ewes" mean ewes from which rams are bred for sale or station use.

10. The employer will add to the earnings of the employee 3d. for every hundred sheep shorn by him by machine.

The employer will charge the employee at cost price, with carriage only added, for all combs and cutters supplied by him.

WORKING REGULATIONS.

11. Before work is commenced lots will be drawn for the pens, and the employee will abide by the result of the drawing, but the overseer may make any change as to the pens that he thinks fit.

12. The employer will provide a minimum space of 5 feet for each shearer on the shearing board in all sheds built since the award of 12th June, 1907.

13. The sheep will be taken carefully by the employee from the pen to the board, and he will take off the belly wool first, and lay it aside.

14. In opening the fleece at the neck and the belly the machine or (if shears are used) both blades of the shears will be kept under the wool, and close to the skin, so as to avoid twice cutting, and the employee will not run the machine or (if shears are used) shears through the fleece so as to break it down the centre of the back, and shall not stand upon the fleece.

15. If the employee badly cut a sheep, or if a sheep be insufficiently tarred, the employee will at once sew and tar the cut, or dress the sheep as directed by the overseer; but in other cases the employee will not be required to tar the sheep.

16. The employee will not kick, kneel upon, or otherwise injure or illuse any sheep, and if he seriously injure or illuse any sheep, or cut the teat of any ewe, or the pizzle of any ram or wether, he will immediately report the fact to the person in charge of the shed, and the sheep will, at the option of the employer, be kept by the employer, or (if fit for food) will be charged to the mess account at the mess rate, or (if unfit for food) against the employee at the mess rate.

17. While his pen is being filled the employee will not catch any sheep therefrom, but will catch from such pen as the overseer may direct; and the employee will not catch any sheep or bring one on to the board after the signal to cease work. The overseer will not permit any other employee to violate this provision on his part.

18. The shearing will be done between the hours of 6 a.m. and 6 p.m. (or such other hours as may be agreed upon between the employer and the shed representative or representatives as regards any particular shed), and not later than 12 noon on Saturday, and the employee need not work for more than eight hours forty minutes per day, or for more than 48 hours per week.

But if ewes or lambs are in the pens awaiting shearing, the shearing may be continued on Saturday after 12 noon for not more than half an hour, with the consent of the claimant organization, expressed by its shed representative (if authorized to consent), and so far only as may be necessary for the purpose of shearing the said ewes and lambs.

19. The employee may refuse to shear sheep—

- (a) If they are cancerous or suffering from any offensive wound or sore or from any disease communicable to the shearers; or
- (b) If the overseer and the shed representative or representatives agree that the sheep are too wet to shear; or
- (c) If, in the honest opinion of the employee, the sheep are so wet as to be likely to injure his health, and he inform the overseer to that effect; or
- (d) If a majority of the shearers, by vote on a secret ballot, determine that the sheep are too wet to shear, and if under the rules of the organization

it is his duty not to shear after such a determination. Provided that the vote be not taken till after the shearers have (if the overseer so request) shorn each two sheep, and that the ballot papers be counted in the presence of the overseer, if he so request.

GENERAL CONDITIONS.

20. The shearing and incidental operations will be carried on under the direction of the employer or person in charge of the shed (in this Agreement called the "overseer").

21. The employer will during the term of employment provide the employees with good and sufficient hut accommodation, cooking utensils, table utensils, clothes-washing utensils, wood, water, and sanitary conveniences, and will provide them in a clean and satisfactory condition, and in accordance with the requirements of or under any Act applicable.

22. If the huts and sanitary conveniences be not kept by the employees in a clean and satisfactory condition, and in accordance with the requirements of or under any Act applicable, the employer may give, in writing, notice to the shed representative, and if the defect be not remedied within 24 hours the employer may cause the defect to be remedied, and charge the cost in equal proportions against the earnings of the employees in the huts concerned.

23. All the utensils will be given up by the employees clean and in good condition (reasonable wear and tear excepted), and any deficiency may be charged in equal proportions against the earnings of the employees for whose use collectively the utensils were supplied.

24. The employer will provide a suitable room or other place, outside the kitchen and sleeping accommodation, for the housing of the saddles, harness, and cycles of the employees, and also a suitable room or other place outside as aforesaid for storing meat.

25. The employer will allow to the employee free run for one horse, or if a maximum of 5,000 sheep or more is to be shorn, for two horses, but is not to be under any responsibility with regard to the horses.

26. If the employee leave or be discharged before completion of the shearing, the employer will either have the employee's horses brought to the shed or provide him with a suitable horse to get them.

27. The employer will provide for use in the huts a suitable disinfectant in sufficient quantity.

28. (a) If the employer discharge a member of the mess who has not to his credit a sufficient sum to satisfy what is due by him to the mess account, the employer will make up the deficiency, except so far as the employee's share of the mess account has been increased by goods purchased elsewhere than from the employer.

(b) Where rations are obtained elsewhere than at the station store, the employer will pay the price on written order or orders given to him by the members of the mess or by any person authorized by them to give the order, and will debit the mess account with the price, and at the end of the shearing debit the members of the mess with their respective shares.

THE SHEEP AND WOOL INDUSTRY

(c) The employer will provide the cook with a pass-book, and have correctly entered therein on each occasion of supplying the particulars and prices of rations supplied by him, and the dates when the several members of the mess are respectively engaged and discharged.

(d) If the employer supply rations and shearers' requisites, he will post in a conspicuous place his price list thereof, and the price to be charged (except for combs and cutters and for meat) will not exceed the cost price with 10 per cent. and carriage added.

29. Before shearing is commenced the employer will appoint a certain day of the week for payment to each employee in each week who requires it, or, on his order, of any portion of his earnings up to 75 per cent. of the amount for the time being due to him over one week's earnings.

30. The employer will also pay at any time on the order of the employee any obligatory contributions or charitable donations out of the amount for the time being due to the employee up to the limit aforesaid.

31. Any cheque given by the employer to the employee will be drawn on a local bank or the exchange will be added.

32. The employer will render to the employee a detailed statement of his account up to date on the day before the completion of the shearing.

33. The employee will conduct himself properly on the station, and will not bring or cause to be brought, or so far as he can help it allow to be brought, any intoxicating liquor to the station.

Signed by the said Employer ROBERT HILL.

In the presence of R. DELLIT.

Signed by the said Employee JOHN BROWN.

In the presence of D. P. WALKER.

CHAPTER VII

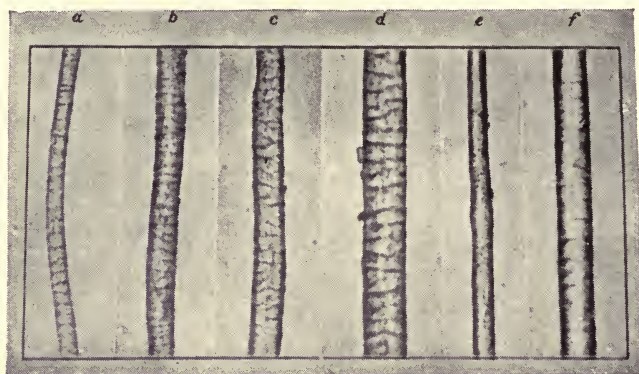
WOOL

Characteristics of wool—Wool qualities, 60's, 64's, etc.—Analysis of wool—Action of acid and alkali solutions on wool—Testing supposed all-wool cloth for adulteration—Carbonizing wool to remove burrs and other vegetable matter—Mercerizing wool.

THERE are a great many different varieties of this most important textile fibre, from the superfine Merino wool, possessing a spinning quality of 70's to 100's, to the coarse, long Lincoln wool, the spinning quality of which is from 36's to 40's.

Wool possesses all the qualities which go to make it a perfect textile fibre. It has sufficient length of staple to enable it to be spun, and when the fibre is examined with a powerful microscope it reveals numerous saw-like edges all round it. These saw-like edges give to wool the power of felting, a quality which very few other textile fibres possess. The saw-like edges of one fibre fit into those of another, giving the material a closely matted or felted appearance. This felting property of wool is seen in woollen felt hats, also in fine woollen cloths such as are used for suitings. The finer the wool the better its felting qualities, because it has more serrations and saw-like edges per inch than the coarse quality wool. Fine wools are usually very short in the staple, while the stronger or coarser wools are much longer. Coarse wools, such as the Lincoln, Leicester, and Cross-bred, generally have a brilliant lustre. Fine wools do not attain the brilliancy of the coarse for the following reasons. Owing to the large number of scales or saw-like edges which all fine wools possess, the

light cannot reflect properly on the uneven surface of the fibres, whereas in the case of the coarse wools the scales are more even and larger, consequently the fibre has a smoother surface, more like that of hair. This smooth surface of the coarse wools gives the light an almost unbroken reflection on the surface of the fibre, thus accounting for their greater brilliancy. In case I am not understood, take, for instance, a piece of unplanned timber with a rough surface and give it a coat of enamel, then take a planed piece of timber with a smooth surface and enamel it also. The wood with the smooth surface will show a much greater



[From "Textiles," by kind permission of A. F. Barker, Esq.]

MICROGRAPHS OF WOOL FIBRES.

- | | | |
|-----------------------|---------------|----------------------------|
| a. Australian Merino. | b. Southdown. | c. New Zealand Cross-bred. |
| d. Lincoln. | e. Alpaca. | f. Mohair. |

lustre than the rough piece, because the reflection of the light is scattered and broken on the unplanned piece, while it has an unbroken reflection on the other. Photographers can get a glossy shine on their prints by pressing them face down on to a smooth glass plate and removing the slightest unevenness on the surface of the print, thus giving it a brilliant gloss as the light has nothing to interrupt its reflection. Wool qualities, or in plainer words, the diameter of the fibres, vary a great deal. Fine Merino wool from 60's to 70's quality has 1,000 to 1,200 scales to the inch for the whole length of the fibre, and English

experts give the diameter as 0·0008 inch, while the high-lustre coarse wools, such as the Lincoln, etc., possess 500 scales per inch, the diameter of the fibre being 0·00091 inch. A great many people in the wool trade do not know what the different terms, such as 64's, 60's, 46's, etc., mean. In spinning, the quality of the wool is known by the number of counts that can be spun from it. A count is 560 yards of spun yarn, and when the term 60's is used it means that a wool of that quality will spin 60 hanks of yarn, each hank 560 yards long, from a pound of the combed top, a 46's meaning that it will spin only 46 hanks of yarn each 560 yards in length. A 70's quality of Merino wool, if it has sufficient length of staple, will spin 22 miles 480 yards of yarn from a pound of top, while coarse Lincoln wool of 36's quality will only spin 11 miles 800 yards of yarn. Nowadays you can get 70's tops (or any other quality) that will not spin 70's because the wool fibres in the top are too short, though the diameter of the fibres is exactly the same as those that will spin 70's. I will, however, go into this in a later chapter.

The chemical constituents of wool vary a little, as no two grades have exactly the same quantity of chemicals which wools consist of. Bowman, a noted authority on textile fibres, in analysing wools of the United Kingdom gives the following :—

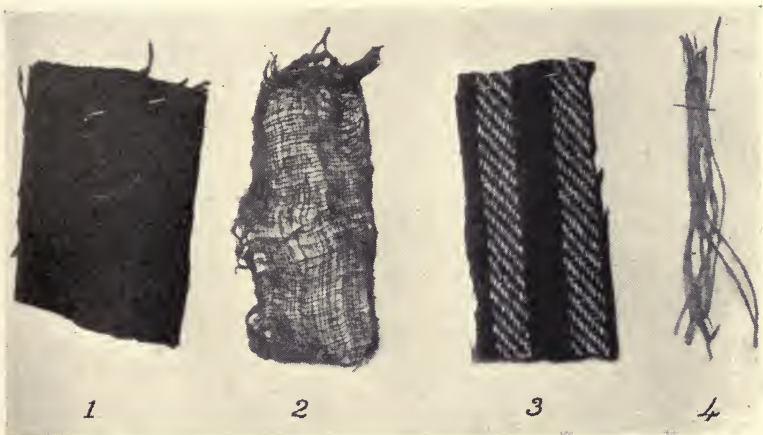
Constituent.	Lincoln Wool.	Irish Wool.	Northumberland Wool.	Southdown Wool.
Carbon	52·0	49·8	50·8	51·3
Hydrogen	6·9	7·2	7·2	6·9
Nitrogen	18·1	19·1	18·5	17·8
Oxygen	20·3	19·9	18·5	17·8
Sulphur	2·5	3·0	2·3	3·8
Loss	0·2	1·0	—	—

The above analyses are of the pure wool fibre, not the wool as it comes off the sheep's back. The fibres were subjected to treatment with water, alcohol, and ether, so as to free them from all impurities such as yolk, earthy matter, etc.

In the centre of almost every wool fibre there is a small hollow tube which is known as the medulla. The medulla varies a lot in diameter in the different classes of wool and hair. The average diameter is from one-eighth to a quarter of the diameter of the whole fibre. The medulla, as I have stated before, varies a good deal and may just be visible in some cases, perhaps disappearing altogether in portions of the fibre, more especially in those fibres which are diseased. The medulla supplies all the juices and nourishment to the fibre which are necessary for its growth. It also contains the pigment matter which gives to the wool its various colours—grey, black, etc. The medulla of the wool fibre plays a very important part in the dyeing processes which wools have to undergo. The colouring or dyeing matter, obtaining access to the medulla at the cut end of the fibre, will run up the small tube and thus thoroughly dye the centre of the fibre, and owing to the fibre's porous and transparent nature, the dye will go through the whole of the fibre, and give it a beautiful, even colour. In some wools the outside layer of scales will not take the dye too readily, and in some cases, such as kempy fibres, it will not take the dye at all, because they are not porous, though the dye will sometimes gain access to fibre at the interstices of the scales. This is one of the reasons why kempy wool is so objectionable to manufacturers. The kempy fibres have long, non-porous closely fitting scales, that will not take the dye, the consequence being that the material containing them will have white, hairy fibres through it, giving it a speckled appearance.

A fibre may have non-porous and closely fitting scales that will not take the dye, but its medulla may be large and even, and the dye will go up to the end of the fibre and will show through the transparent sides, just the same as a white glass bottle filled with a coloured solution would appear. Pulled, or slipe wool—that is, wool which has been taken off a sheep-skin—is much harder to dye than shorn wool, as the flesh end of the fibre is generally closed owing to the juices of the hair-follicle hardening. On examining the flesh end of pulled wool you will also notice a small skin-like material covering the

fibre or the end of the staples. This prevents the dye from gaining free access to the medulla, the consequence being that you cannot obtain from pulled wools the full rich colours which shorn wools give. Wool will resist most acids but will dissolve if subjected to strong alkalies such as caustic soda. You can completely dissolve wool by boiling it in a 10 per cent. solution of caustic soda. Silk is another animal fibre which will dissolve in strong alkali solution. Cotton and all material made of vegetable fibre will resist the action of



[Photo by Author.]

1. Cloth made up of wool and cotton.
2. Same cloth with wool removed by immersing in caustic solution.
3. Wool cloth with white cotton yarn running through it.
4. Wool removed as before, showing quantity of cotton left.

alkalies. Cloth can be tested to see whether it is all wool, or a mixture of both wool and cotton, or any other vegetable fibre, by immersing it in a strong solution of caustic soda for a couple of minutes—a dessert-spoonful in a breakfastcup of very hot water. This caustic solution will completely dissolve all the wool, and if the piece of cloth tested is made of pure wool without any cotton or other vegetable fibres mixed through it, it should dissolve completely, just a very small and slimy solution being left in the bottom of the cup.

On the other hand, if the cloth is a mixture of wool and cotton, the cotton will remain undissolved. I have frequently tested small pieces of tweed in this manner with the result shown in the illustration.

Over-scouring wool has a bad effect on the fibres. Over-scouring is caused by having the liquor in the scouring tanks too hot or too strong—that is, liquor containing too much caustic soap. Wool scoured in liquor like this gets washed in an alkali bath which dissolves the extreme and delicate edges of the fibres, thus injuring their felting properties and making them brittle and harsh to the touch, which is a great detriment to the wool when undergoing the combing and spinning process, as it is inclined to fly, and a good number of the fibres break when subjected to the tension necessary in the production of some yarns. Any temperature over 230° F. will dissolve the oil contained in the medulla of the wool fibres. It is necessary for all wools to retain this oil; if not they lose a great deal of their elasticity and pliability. Wool will resist most acids, though it can be destroyed by immersion in a solution of very strong mineral acid.

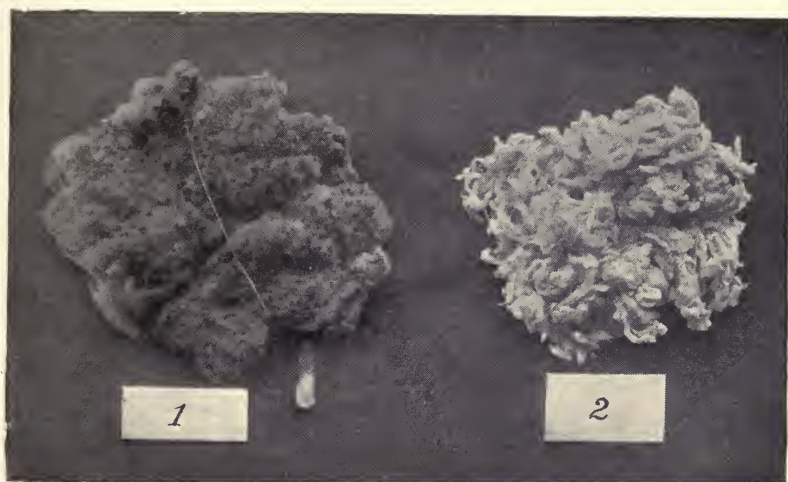
Cotton, linen, and other textile fibres of vegetable origin will resist the action of caustic and alkali solutions, but they are destroyed by the action of acids that wool will resist.

Some manufacturers have an acid test made on each roll of their cloth to prove that it contains no cotton or vegetable fibres, as, if so, the acid would have eaten these out and left a hole in the cloth.

By immersing wool in a solution of sulphuric acid, strength 6° *Twaddle*, the temperature at 150° to 160° F., you can destroy any vegetable matter in it without any great injury to the wool fibres. This is how all the burrs, seeds, and vegetable matter are removed from short wools, the acid reducing them to a brittle state, so that if you got one of the burrs and pressed it between two of your fingers it would crumble into a fine dust.

After leaving the acid bath the wool is artificially dried

and the burrs shaken out in the form of dry dust by a machine called the "Willey." The above process is called carbonizing. If the wool has sufficient length of staple the burrs can be combed out of it, and it is not necessary to have it carbonized. Carbonizing is used for other purposes besides that of removing burr from wool. It plays an important part in the manufacture of shoddy. Shoddy is the trade term for goods that have been made up from woollen rags, or wool that has been manufactured in some other form



[Photo by Author.]

1. Extra heavy burry lambs' wool.
2. Same wool after scouring and carbonizing by immersion in weak sulphuric acid solution.

before. A good many rags contain nothing else but wool. These do not require carbonizing, and they are sorted and kept by themselves, but a great quantity of the rags used are mixtures of wool and cotton, or some other vegetable fibre. These rags are submerged in a bath of sulphuric acid of 60° Twaddle. The acid will destroy all the vegetable thread or fibres such as linen and cotton, thus leaving only the pure wool fibres. Wool obtained from rags in the above manner is called Extract wool, and it generally contains fibres of every

quality and of various lengths. This Extract wool is generally used in low-priced or shoddy goods, though in a few cases it is made into a good article. One of the most peculiar things about caustic alkalies is that if you make a very strong or concentrated solution from 80° to 100° *Twaddle*, the temperature at 20° C., it will not dissolve wool at all, but considerably strengthens the fibre and bleaches it. Wools are mercerized in this manner—that is, making them resemble silky goods, and increasing the lustre of the fibres. The concentrated caustic alkali solution has the power of closing up all the scales, thus making the surface of the fibre smooth like hair. This closing up of the scales would give the wool the increased lustre, and also account for its greater tensile strength.

CHAPTER VIII

MOISTURE IN WOOL

Testing wool or tops for moisture—Amount of moisture permissible in wool and tops.

WOOL is the most hygroscopic of all textile fibres—that is, its power to retain moisture is greater than any other textile fibre. The normal amount of moisture in wool is 16 per cent., and if a sample contains, say, 20 per cent. of moisture, it will lose 4 per cent. of its weight if kept for any length of time in a normal temperature.

Greasy wool will not absorb so much water as scoured wool or tops. Buyers can therefore detect moisture in greasy wool much more easily than they can when it is in the scoured state. The reason for this is, that all the grease or yolk is removed from the scoured wool, and the moisture gains free access to the fibre and lodges in its interstices and cells, whereas in the greasy state it is much more difficult for the moisture to obtain access to the fibre because it is surrounded by a thin coating of yolk. Consequently, the moisture is more easily detected, being mostly confined to the outside of the fibre. All wool that is shorn damp will lose weight if kept for any length of time, till the moisture it contains does not exceed 16 per cent. Sometimes, in the back-country, where the wool is shorn in excessively hot weather, the moisture it contains may be below the 16 per cent. In this case the wool will gain weight when kept for a short time in a normal temperature. In Bradford the wool merchants have fixed a standard amount of moisture in the various classes of raw and partially manufactured wool. These standards were obtained by testing for several months

the raw material that the outside atmosphere had free access to, and averaging the different amounts of moisture that the tests showed. The amount of moisture permissible in Bradford is :—

	Per cent.
Wool and waste	16
Dry combed tops	18 $\frac{1}{4}$
Oil	19
Noils	14
Wool yarn	18 $\frac{1}{4}$
Woollen and worsted cloth	16

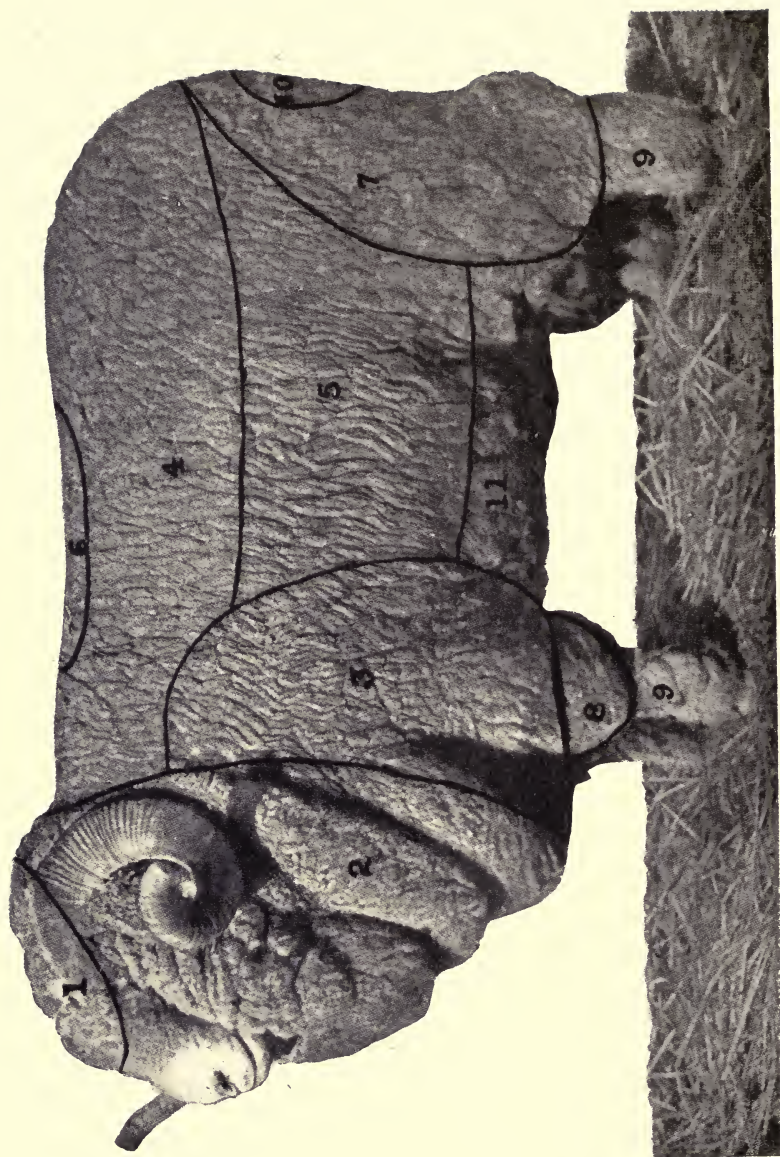
In testing a sample, say, 1 lb. weight of wool or tops, care should be taken to draw a fairly representative sample. The wool or the tops is placed in a small wire cage ; this cage is a portion of a scale. The weights are then put on to the other arm of the scale to balance the weight of wool in the cage. This cage containing the wool is suspended inside a small oven, through which hot air is forced, the temperature being kept at 220° F., or taking the two extremes of 212° F. up to 230° F. As the moisture is evaporated from the wool in the cage the person testing the sample takes off weights from the opposite arm of the scale, so that a balance is kept. When the balance is held for five minutes all the moisture has evaporated out of the wool in the cage. The tested sample is now absolutely dry. The weight it has lost is then taken from the original weight, and 16 per cent. added to the remainder. This will give the invoice weight, and that is the weight the merchants will pay for. Say, for example, I test 100 lb. weight of wool. This is an excessive quantity to test, but I am quoting it for example. The weight when it comes from the tester is 81 lb. This is dry wool free from all moisture. On to this weight I add the 16 per cent. regain—the amount of moisture permissible. This gives me 97 lb. of wool, which is the correct invoice weight which is paid for. The above sample contained 19 per cent. of moisture, or 3 per cent. more than is permissible, therefore I pay for only 97 lb. of wool for every 100 lb. bought.

CHAPTER IX

WOOL-SORTING

Sorting fleece-wool, pieces, stained wool, locks, lambs' wool, crutchings, dead wool—Wool-sorters' disease, "anthrax."

WOOL-SORTING is the first process which greasy wool undergoes when it is purchased by the manufacturer. Wool-sorting, or grading, as it is sometimes called, is the dividing of the fleeces, or pieces, into their respective spinning and other qualities. Sorting must not be confounded with wool-classing, as the former is done by the manufacturer, the latter, in most cases, by the pastoralist, so that his clip is placed on the market in as even lots as possible. This makes the sorting of classed clips much easier than those that have not been classed at all. Each individual fleece contains several qualities of wool, though Merino wool does not vary in quality like the cross-bred. In most cases the fleeces have burry and fatty wool all round their edges. These burry edges are caused by the sheep lying down and the burrs adhering to those portions of the wool which they come in contact with—namely, the wool on the britch or hams, also the wool on the sides and belly. This burry wool is skirted or pulled apart from the rest of the fleece and is sorted into its various spinning qualities. The sorter will therefore have two sorts of wool of the same spinning quality; the only difference is that one contains burr and the other is free from it. This burry wool has to undergo the carbonizing process which I have described in a previous chapter. In sorting fleece wool, the fleece is first opened out on the table, and any brands it contains, such as tar and



KEY TO DIAGRAM.

- No. 1. **TOP-KNOT.**—Consisting of very light, short, moiety, and inferior wool.
- No. 2. **NECK WOOL.**—Very light-conditioned and long-stapled wool, also containing coarse matted lumps of inferior wool on the folds; the latter wool is separated from the other by the piece-pickers employed by the pastoralist.
- No. 3. **SHOULDER WOOL.**—The best wool grown by the sheep is obtained from the shoulder. Sheep judges, when judging, usually take the shoulder wool as a standard, and see how the wool on the other portions of the sheep compare with it.
- No. 4. **FLEECE WOOL.**—Consisting of good average fleece wool, usually free from all vegetable matter.
- No. 5. **BRISKET WOOL.**—Similar to shoulder wool (No. 3); usually a little heavier in condition.
- No. 6. **BACK WOOL.**—This wool is inclined to be open and mushy on sheep grazing on the red sandy back-country in western New South Wales and northern South Australia, where the back wool becomes full of sand; on this account it should be removed from the fleece and baled up separately.
- No. 7. **BRITCH WOOL.**—A coarser wool than the other portions of the fleece and in many cases inclined to be kempy; the wool is also matted with burr or seed unless country is free from it.
- No. 8. **ARM PIECE.**—Consisting of very short wool surrounded by fribby edges; burrs or seeds collect very thick on this portion of the fleece.
- No. 9. **HAIRY SHANKS.**—Hairy or kempy fibres containing very little wool; they are used for the manufacture of low quality goods such as cow or horse rugs when blended with other wools.
- No. 10. **STAINED WOOL.**—This wool will not wash white, and is very heavy in condition. Stained wool from ewes should always be dried before baling.
- No. 11. **BELLY WOOL.**—A good bulky wool, heavy in condition, and usually very burry or seedy.

raddle, are removed and placed by themselves. The next thing is to take off the stained britch wool. This portion of the fleece is stained by urine and it will not scour white, consequently this class of wool can only be used for goods that are to be dyed a very dark shade. Stained wool is of less value than any other portion of the fleece. In most cases it is taken off by the wool rollers or skirters on the sheep station, at shearing time ; but in some instances, especially in farmers' clips, it is very often left on, and has to be removed by the wool-sorter ; the stained wool is generally the coarsest portion of the fleece. When the sorter has taken the stained wool off the britch, he removes any dags from it, and places the wool with stained wools of the same quality. The usual sorts of stained wool that are made by top-makers, etc., are as follows :—

Merino Stained Comb.—Consisting of all Merino stained wools of 60's quality.

Fine Cross-bred Stained Comb.—Consisting of all stained comb wools of 50's and 56's quality.

Medium Stained Comb.—Consisting of all stained comb wools of 50's quality.

Coarse Stained Comb.—Consisting of stained wool of 46's quality.

Lincoln Stained Comb.—All Lincoln stained wool of 40's and 36's quality.

The sorter will then remove all the burry portions of the fleece, which are usually confined to the edges of it. The burry wool is sometimes sorted into two sorts—light burry and heavy burry—though in many places all the burry wools are kept together. The heavy burry portions of the fleece consist of the arm piece, as the wool running down the fore-leg is called, and all the extreme edges of the fleece, where the burr and dirty yolky ends are always the heaviest ; this heavy burry wool is then graded into its various qualities.

The light burry wool is next skirted off and also graded into its various qualities ; the remaining portion of the fleece should be all good, clear fleece wool, free from burr, brands, and stained wool. This is also graded into its different qualities. The finest and best wool comes off the shoulders and along the sides of the

sheep. The wool on the back is not so dense as that from the shoulders and sides, and is inclined to be open. This is very noticeable when the sheep are on dry, sandy pastures such as northern South Australia, and Broken Hill District of New South Wales. The number of qualities that combing wool is usually assorted into is as follows :—

Fine Merino.—Consisting of a very fine Merino wool of 70's quality. In some top-making establishments they make lines of 80's and 100's quality, but they are sorted out of special lots of wool.

Merino.—Consisting of Merino combing wools of 60's and 64's quality.

Comeback.—Consisting of combing wool of 58's quality. This quality is generally obtained from Cross-bred sheep that have been bred back to the Merino side, hence the name Comeback.

$\frac{1}{4}$ -**Bred.**—Consisting of combing wool of 56's quality, and obtained from fine Cross-bred sheep bred similarly to the Comeback, the wool being a shade stronger.

$\frac{1}{2}$ -**Bred.**—Consisting of combing wool of 50's quality. This wool is just between the quality of the Lincoln or Leicester and the Merino, and is grown on the average sheep of that cross, though a good many of the progeny of this first cross will grow wool which resembles the sire more than the ewe.

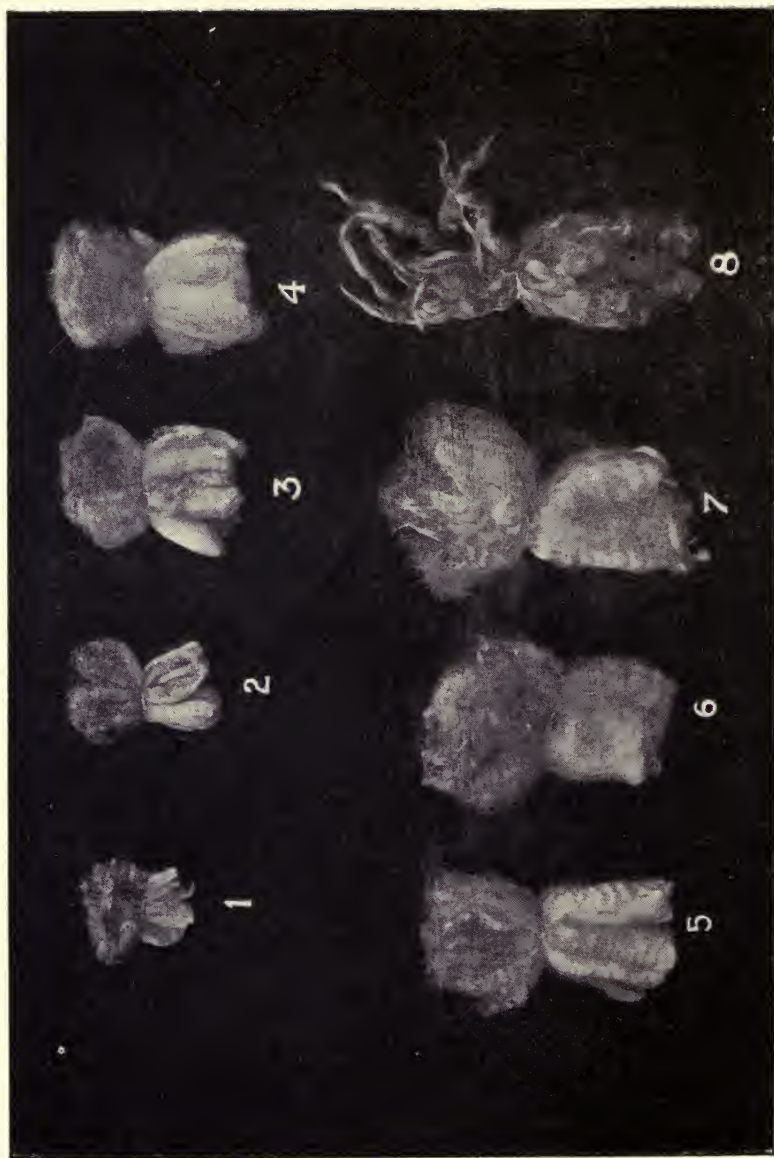
$\frac{3}{4}$ -**Bred.**—Consisting of all combing wool of 46's quality. This is obtained from Cross-bred sheep, a shade coarser woolled than the $\frac{1}{2}$ -bred. A Lincoln ram crossed with a first cross ewe will in most cases produce progeny growing a wool of this quality.

Lincoln or Leicester, etc.—Consisting of combing wools of 40's quality. This is obtained from the average English long-woolled breeds.

Cowtail.—Consisting of comb wool of 36's to 32's quality. The latter quality is usually obtained from Lincoln, Cotswold, and other long-woolled sheep that have very coarse fleeces. The average well-bred Lincoln ram has a fleece of 40's quality, and the britch end of the fleece will generally be a 36's to 32's quality, as the britch wool is generally coarser than the other portions of the fleece.

The above are most of the English qualities that combing wool is sorted into. In some places the sorts may be called by different names, but the qualities are about the same.

As I have mentioned before, the sorter has to make a clear wool, that is, a wool free from burr and other vegetable matter, also a light and a heavy burry line. Thus he will have several types of wool of the same quality. Tender wools are generally sorted into qualities by themselves, as are the short-stapled wools.



[Photo by Author.]

1. 70's Merino.
5. 50's $\frac{1}{4}$ -bred.

2. 60's Merino.
6. 40's $\frac{3}{4}$ -bred.

3. 58's Comeback.
7. 40's Lincoln.

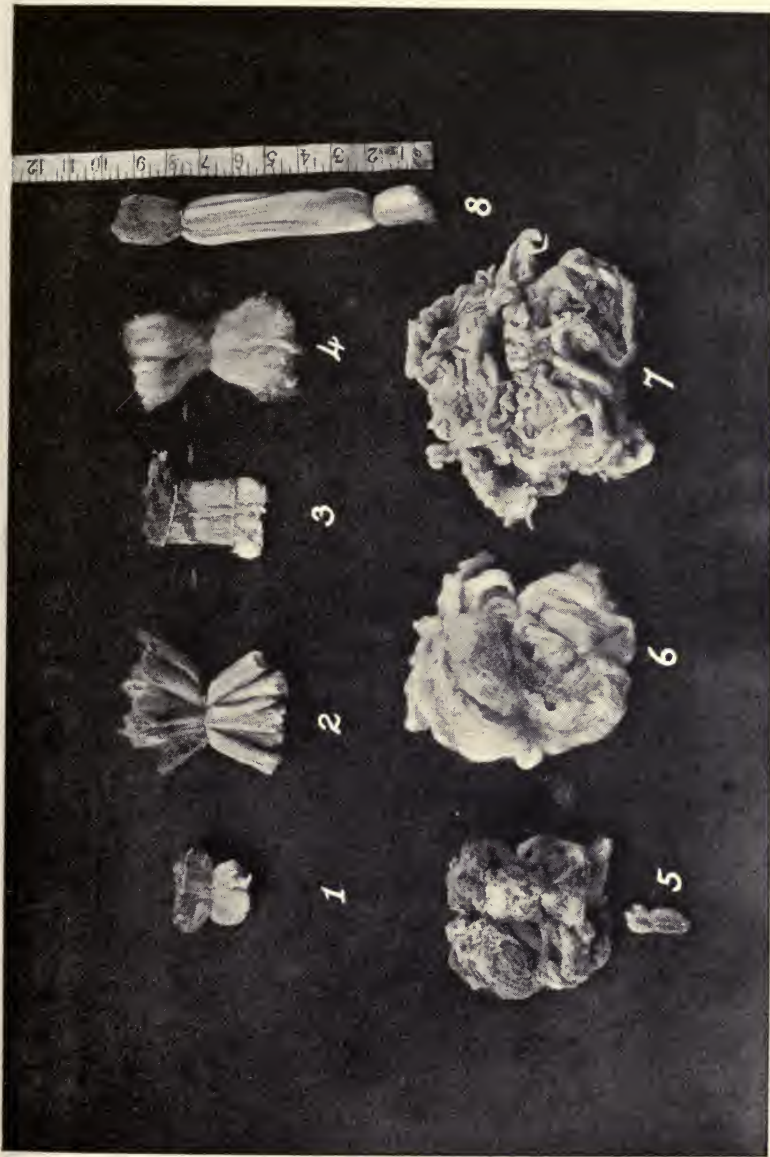
4. 56's $\frac{1}{4}$ -bred.
8. 36's Coarse Lincoln.

All cotted wools have to be kept in qualities by themselves. In large wool-combing establishments they have a wool-classer who classes all the fleece wool into its qualities and lengths, and keeps short, tender, and cotted wools separate, so that the sorter will not be troubled with keeping out tender and short wools. His work will be confined to making separate sorts of the free and burry wool, also stains, and any variations in the quality of the fleece, as a Merino fleece may have wool of 58's or 56's quality at the britch end. In sorting pieces sorters are seldom asked to pick out tender or short wools and grade them separately. The sorts I have named are not made in every sorting shop, or scouring establishment, as some do not purchase enough wool to make large lines and usually work two or more qualities together.

We will next take the low wools, such as locks, crutchings, etc. Locks consist of all the very short fribby bits, such as second cuts, and little scraps of wool that fall from the fleece during shearing, and are too short to allow them to be combed. Locks are sorted on quality, but the sorter does not have to separate them except in a few cases, such as small dealers' bales, which are often made up from bag lots of every quality; in these bales you would very likely get Lincoln quality locks mixed together with fine Cross-bred or Merino quality locks. The sorter would have to separate them, but each quality is generally in a layer by itself. They can therefore be separated and each individual quality sorted by itself. In most cases a bale of locks is sorted for Merino or $\frac{1}{2}$ -bred, or any quality that predominates in it, as it would not be practical to separate a few $\frac{1}{4}$ -bred quality locks that are mixed through a bale of $\frac{1}{2}$ -bred quality locks. In sorting a bale of Merino, or any other quality of locks, the sorter first shakes them up thoroughly, so that they will run over the table easily. He must pick any combing wool out of them, that is, pieces that have fallen into the locks, and any long staples. The small pieces must be well shaken to remove all the locks which usually adhere to them. These combing pieces are thrown in a basket together and sorted

with the combing wool. The small stained locks are also picked out and kept by themselves. Very often an inexperienced wool-sorter will pick out the small, dark, black, yolky locks for stained. Only those locks that are stained by urine or dung should be picked out, as all the black polky fribs will scour white. The sorter must take out all the dags, no matter how small they are, as if they are left in they become soft in the tank of the scouring machine, and when they are going through the rollers at the end of each tank they get squashed and stain all the wool around them. When the wool is dry they look like black buttons surrounded by stained locks, thus considerably lessening the value of the scoured wool.

The hairy stockings, or shanks, as they are called in most sorting shops, have to be taken out also, and a separate sort made of them. The shanks come off the bottom portion of the sheep's legs, and consist of strips of short, hairy, and kempy fibres. Merino shanks are kept separate from Cross-bred, as the former are much the finer. The sorter has to remove all foreign matter, such as broom whisks, matches, etc., which are often found mixed through the locks. The sorts or qualities of locks that are made in the scouring establishments in Australia are practically the same as the combing wool qualities. Free locks are kept separate from the burry, and any discoloured locks, such as charcoal stained or red sandy locks, are kept out of the general lines, as they do not scour up perfectly white. Heavy burry locks are made into lines by themselves; in this sort they generally blend two qualities together, confining them to a Merino, a fine medium, and coarse Cross-bred quality. The stained locks, which are picked out of the ordinary locks, are also graded into their different lines. Stained locks scour up a dark reddish or brown colour, according to the quantity of urine stains they contain. Table locks are also kept apart from the others. These consist of all the second cuts that fall underneath the wool rolling tables at shearing time. Most sorting establishments only keep table locks separate in the Merino quality.



[Photo by Author.]

1. Short American Vermont Merino.
2. Bold long-stapled South Australian Merino.
- 3 & 4. Wool with break in fibres.
5. Showing how fine Merino wool holds the sand in the hot back-country.
6. Scouring without sorting, showing how dags spoil the appearance of scoured wool.
7. Badly scoured or roped wool.
8. Wool of three years' growth.

In the large wool-scouring establishments the following lines of locks are usually made :—

- Merino Super Locks.**—Consisting of all the fine clean table locks free from burr stains, kemp, etc.
- Merino Free Locks.**—Consisting of all the good Merino locks free from burr, stains, kemp, etc.
- Merino Light Burry Locks.**—Consisting of all the light, burry, Merino locks free from stains, kemp, etc.
- Comeback Free Locks.**—Consisting of all the locks of 58's or Comeback quality, free from burr, stains, kemp, &c.
- Comeback Light Burry Locks.**—Consisting of all the Comeback locks containing light burr, free from stains, kemp, etc.
- $\frac{1}{4}$ -Bred Free Locks.**—Consisting of all locks of 56's quality free from burr, stains, kemp, etc.
- $\frac{1}{4}$ -Bred Light Burry Locks.**—Consisting of locks of 56's quality containing light burr, but free from stains, kemp, etc.
- $\frac{1}{2}$ -Bred Free Lock.**—Consisting of all locks of 50's quality free from burr, stains, kemp, etc.
- $\frac{1}{2}$ -Bred Light Burry Locks.**—Consisting of locks of 50's quality containing light burr but free from stains, kemp, etc.
- $\frac{3}{4}$ -Bred Free Locks.**—Consisting of all locks of 46's quality, free from burr, stains, kemp, etc.
- $\frac{3}{4}$ -Bred Light Burry Locks.**—Consisting of locks of 46's quality, containing light burr, but free from stains, kemp, etc.
- Lincoln Free Locks.**—Consisting of locks of 36's and 40's quality, free from burr, stains, kemp, etc.
- Lincoln Light Burry Locks.**—Consisting of all locks of 36's and 40's quality, containing light burr but free from stains, kemp, etc.
- Merino Shanks.**—Consisting of all the hairy and kempy strips of wool off the legs of Merino sheep.
- Cross-bred Shanks.**—Consisting of all the hairy and kempy strips of wool off the legs of Cross-bred sheep.
- Merino Stained Locks.**—Consisting of all the stained locks picked out of the Merino free, and light burry locks.
- Fine Cross-bred Stained Locks.**—Consisting of all the stained locks picked out of the Comeback and $\frac{1}{4}$ -bred locks.
- Medium Cross-bred Stained Locks.**—Consisting of stained locks picked out of the $\frac{1}{2}$ -bred or 50's quality locks.
- Coarse Stained Locks.**—Consisting of stained locks picked out of the $\frac{3}{4}$ -bred and Lincoln locks.
- Black Points.**—Consisting of all the black fribs and Shropshire shanks.

The heavy burry locks are very seldom scoured or sorted in Australia. They are usually sent to Verviers, in Belgium, where they are carbonized and scoured. They make a speciality of

treating these heavy burry wools in Belgium. I have used the terms 46's, 50's, etc., in referring to the quality, of the locks. By that I do not mean to say they will spin these counts, but they consist mostly of second cuts and fribs from wools of those qualities. A wool may be a 60's quality, such as most Merino locks are, but it is often too short and shabby to spin the number of counts its quality denotes, viz., 60 hanks of yarn, each 560 yards long.

SORTING LAMBS' WOOL.

Lambs' wool is rather difficult to sort, as it is sorted on length of staple as well as quality, and you frequently get lambs' wool of every length and quality in a bale, especially those packed by farmers.

In some wool-sorting establishments where they sort lambs' wool for combing purposes, they sort it into all the counts, just the same as the other combing wool. Only long-stapled Merino and cross-bred lambs can be combed economically. Sorting lambs' wool into all the counts and keeping the long, short, and free lambs' wool separate, is very difficult work, and requires a skilled sorter. If the lambs' wool is well classed the sorter will not have any great difficulty, because all the free, burry, and stained wool is in separate lots. The following is a list of the lines of lambs' wool that I have found suitable when sorting bales of lambs' containing every quality. These lines are made by some of our leading wool merchants in Australia.

Super Merino Lambs'.—Consisting of all the long-stapled, bright, Merino lambs' wool free from burr and any heavy, fatty, or discoloured wool.

Merino Free Long Lambs'.—Consisting of all the lambs' a little shorter than the Super, free from burr, stains, fribs, and discoloured wool.

Merino Light Burry Lambs'.—Consisting of all the Merino light burry lambs' free from stains, fribs, etc.

Merino Short Lambs'.—Consisting of all the extremely short Merino lambs'. It is advisable to make two lines of this sort—a free and a burry.

Super Fine Cross-bred or Comeback Lambs'.—Consisting of all the bright long-stapled lambs' of 58's and 56's quality free from burr, fribs, stains, etc.

- First Long Fine Cross-bred or Comeback Lambs'.**—Consisting of all the bright, long-stapled lambs' wool of 58's and 56's quality containing light burr or seed, all fribby ends and stains being kept out.
- First Fine Short Free Cross-bred Lambs'.**—Consisting of all the short-stapled lambs' of 58's and 56's quality, free from burr, fribby ends, stains, etc.
- Second Fine Short Light Burry Lambs'.**—Consisting of all the short, light burry lambs' wool containing all the fribby ends, but free from urine and dung stains.
- Heavy Burry Fine Cross-bred Lambs'.**—Consisting of all the heavy burry, fine, cross-bred lambs', keeping out any stains.
- Super Medium Cross-bred Free Lambs'.**—Consisting of all the long-stapled lambs' of 48's to 50's quality, free from burr stains, fatty ends, etc.
- Medium Cross-bred Light Burry Lambs'.**—Consisting of all the long-stapled lambs' of 48's to 50's quality, containing light burr, but free from stains, fatty ends, etc.
- Second Medium Cross-bred Lambs'.**—Consisting of all the short-stapled lambs' of 48's to 50's quality, containing light burr, fatty ends, etc., but free from urine and dung stains.
- Medium Heavy Burry Lambs'.**—Consisting of all the excessively burry lambs' of 48's and 50's quality.
- Super Coarse Cross-bred Lambs'.**—Consisting of all the long-stapled lambs' of 40's and 44's quality, free from burr, stains, etc.
- Coarse Cross-bred Light Burry Lambs'.**—Consisting of all the light burry lambs' of 40's and 44's quality, free from fatty ends, stains, etc. Any very hairy lambs' should be kept out of this and the Super line.
- Second Coarse Cross-bred Lambs'.**—Consisting of all the shorter and fribby ends, etc., containing light burr, but free from urine and dung stains.
- Heavy Burry Coarse Lambs'.**—Consisting of all the excessively burry coarse lambs' free from urine and dung stains.
- Merino Stained Lambs'.**—Consisting of all the Merino lambs' stained by urine and dung, but free from dags.
- Fine Cross-bred Stained Lambs'.**—Consisting of all the fine cross-bred lambs' 58's and 56's quality that are stained by urine, dung, but free from dags.
- Medium Cross-bred Stained Lambs'.**—Consisting of dung and urine-stained lambs' of 48's and 50's quality, free from dags.
- Coarse Cross-bred Stained Lambs'.**—Consisting of urine and dung-stained lambs' of 44's and 40's quality, free from dags.

In naming the sorts I have endeavoured to give them descriptive names, but most wool-scourers and dealers who sort wool have brands of their own for the various lines they make. All charcoal-stained or discoloured lambs' will not scour up a good white, and they should be kept out of the ordinary lines, and made up into

separate lots. Any kempy or hairy lambs' wool should be kept separate from the ordinary lines of lambs' wool.

SORTING CRUTCHINGS.

Wool which is shorn from the britch of the sheep a few months before shearing is called "crutchings." Crutching, as this shearing is called, is done to keep the maggot fly from the sheep. Owing to the damage done by this pest, the majority of farmers are compelled to crutch their sheep. Crutchings are sorted in a manner somewhat similar to lambs' wool, though 25 per cent. to 50 per cent. of the crutchings are stained by urine, and the stained wool has to be kept separate from the clear wool. The following lines of crutchings are made in most scouring establishments :—

Merino Free Crutchings.—Consisting of all the Merino crutchings free from burr and stains.

Merino Burry Crutchings.—Consisting of all the Merino burry crutchings, free from stains.

Merino Stained Crutchings.—Consisting of all the Merino stained crutchings.

Fine Cross-bred Free Crutchings.—Consisting of all the fine Cross-bred crutchings free from burr and stains, etc.

Fine Cross-bred Burry Crutchings.—Consisting of all the fine Cross-bred burry crutchings free from stains.

Fine Cross-bred Stained Crutchings.—Consisting of all fine Cross-bred stained crutchings.

Medium Cross-bred Free Crutchings.—Consisting of all the crutchings about 50's quality, free from stains and burr.

Medium Cross-bred Burry Crutchings.—Consisting of all the burry crutchings of 50's quality, but free from stains.

Medium Stained Crutchings.—Consisting of all the stained medium quality crutchings.

Coarse Cross-bred Free Crutchings.—Consisting of all the coarse crutchings, free from burr stains.

Coarse Cross-bred Burry Crutchings.—Consisting of all the coarse, burry crutchings, free from stains.

Coarse Stained Crutchings.—Consisting of all the coarse stained crutchings.

In some wool-sorting establishments they would make more lines than I have named, as they make them in all the qualities, such as Comeback, $\frac{1}{4}$ -bred, $\frac{1}{2}$ -bred, &c., while in other places they would not make them into as many sorts as I have mentioned.

DEAD WOOL.

Dead, or fallen wool, as it is sometimes called, is plucked, or falls off, dead sheep. Dead wool is sorted on lines similar to ordinary wool, but all plucked wool is kept separate, as it is much cleaner than the ordinary dead wool which is picked up in the paddocks. Plucked wool is usually pulled off a sheep that has not been dead any great length of time, but is too much decomposed to skin. Sorting dead wool is dangerous work, and in most countries it is sorted on a fine mesh wire table with a fan working underneath so that all the dust will be sucked down. Sometimes the wool is steeped in water before sorting. Sorters working on dead wool have often contracted anthrax, a very deadly disease which sheep die from. D. J. H. Bell, late Surgeon to the Bradford Infirmary, whose position has given him many opportunities of diagnosis and observation, has lectured on the subject and the lecture has been published by the *Lancet*. He says: "The sorting of wool is generally considered to be a healthy occupation, but the sorting of hairs which are classed with wools, such as alpaca and mohair, has long been known to be attended with considerable risk to life. During my inquiry into the causes of this, I have found sufficient reason to include with them as similarly dangerous all wools and hairs that are characterized by being dry, dusty, and more or less filthy, from contamination with decomposing animal matter, and particularly if they contain fallen fleeces from diseased animals. The sorting of this class of wool is injurious to health, first from the dust and fine short hairs which arise from them, exciting chronic diseases of the lungs as bronchitis and consumption; second, from the amount of virulence and poison from the decomposing animal matter which is liberated, producing a low form of pneumonia; third, from a specific blood poison derived from the fleeces of animals which have died from anthrax, producing the rapidly fatal disease called anthrax, or wool-sorters' disease. The law in Great Britain and other countries compels manufacturers to soak or steam the dangerous wools and also to provide respirators for the sorters employed upon them."

CHAPTER X

MANUFACTURING

Woollen and Worsted Method—Tops—Yarns.

GREASY wool has to undergo a large number of processes before it is converted into the beautiful woollen fabrics that are made from it at the present time. There are two distinct branches of wool manufacture. They are known as Woollens and Worsteds. Woollens consist of all rough Tweeds, Blankets, Flannels, etc. Worsteds consist of all fine Worsted Suitings, Twills, and goods with a smooth woven surface. I will first explain the different processes in the manufacture of woollens.

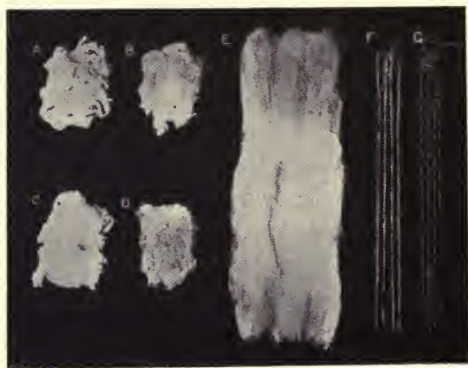
After the wool has been scoured it is dyed into whatever colours decided upon, and then dried.

After dyeing the wool is put into a teasing machine, which thoroughly opens up the wool, throwing it out in a light, feathery state.

Burring is the next operation. Some burring machines crush the burr, the residue being removed during the carding. This method is rather detrimental to the wool, making it hard and dead to the touch. A more modern method of removing burr is by Morel's system. The Morel machine takes the place of the top divider of the carder, the wool being run on to a drum covered with thousands of fine wire teeth set very close to one another. The wool fibres sink down in between the wire teeth, but the burrs and seeds, being too large to follow, have to remain on top. As the wire-covered roller revolves it comes in contact with a set of revolving blades working so close to it that as the

burrs and seeds are knocked off, they fall into trays made to hold them. Another method of removing burrs from short wool is by carbonizing—that is, the immersion of the wool in a weak solution of sulphuric acid of 6° to 9° *Twaddle* and then drying in a temperature of 180° F., after which the burrs can be beaten out in the form of dust. Sometimes woollens are carbonized in the piece—that is, after the wool has been woven into material.

The next process is oiling the wool. Without oil the wool would be inclined to fly, and would lack the necessary flexibility



[From "Textiles," by kind permission of A. F. Barker, Esq.]

STAGES IN WOOLLEN YARN SPINNING.

- A. Wool to be blended with cotton (B).
- C. Blend of oiled wool from Fearnought.
- D. Blend from Scribbler.
- E. Blend in rope-like form from intermediate card.
- F. Condensed slivers.
- G. Mule-spun thread.

for the carding and spinning operations. Olive oil is the best for this purpose, but many manufacturers use cheaper oils.

The wool is usually blended after oiling. This is done in a special room called the blending room.

Blending is one of the very important processes in woollen manufacturing, as the cost and appearance of the finished material depend on the manner in which the wool is blended. It is here that wools of various colours are mixed together ; for instance, the grey colour of most woollens is obtained by blending together a

small quantity of black wool with the white. Pink-coloured flannel is obtained by mixing vermilion-dyed wool with white, not by dyeing it pink as many people imagine. Cotton and shoddy are often blended with the wool when a cheap class of material is required. After blending, the next process is carding. The amount of dislocation which the fibres are subjected to when passing through the carding machine is almost incredible. The machine consists of a large number of rollers, covered with about 65,000,000 fine wire teeth. A set of carding machines consist of three parts, called the scribbler, the intermediate card, and the condenser.

Carding leaves the wool in one broad layer of evenly mixed and thoroughly distributed fibres from 50 to 72 inches in width. From the carder the wool goes into a condenser which cuts this wide fibre of wool into a number of small reed-like threads with no twist in them at all. The long untwisted woollen threads are run on to the condenser bobbins.

The next operation is the spinning. The bobbins of condensed sliver are placed on the stationary part of the mule spinning frame, which is mostly used for spinning woollen yarns. The spinning frame has a travelling carriage in addition to the stationary portion. On this travelling carriage spindles are placed which give the yarn the necessary twist on its outward run, and wind it on to small bobbins on its return. This machine has five objects to accomplish : it first gets the required length of wool ; second, it draws it out finer and longer ; third, it gives the necessary twist ; fourth, it then unwinds ; fifth, it winds the yarn on to the cops.

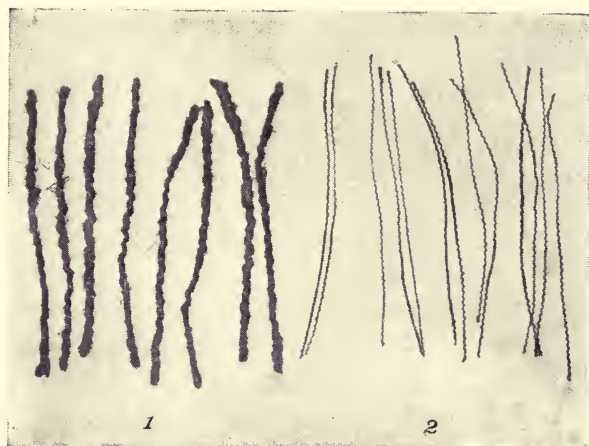
There are what are called continuous spinning frames, but most woollen yarns are spun in the woollen mule, which is unequalled for producing soft and full yarns from short and unsound material.

The wool leaves the spinning frame in the form of yarn wound on spools.

Warping follows spinning. Warping is the obtaining of a number of warp threads of the same length and strength. This is done by winding the yarn on to a large wooden drum till the

desired length is obtained. It is then run off the drum on to a loom beam. By doing this the necessary length of the warp yarns are obtained ; some may be in different colours. The weaver is thus able to determine the position and colour of every warp-thread in the material.

Weaving follows spinning and warping. Weaving is simply the interlacing of the warp and weft yarns. There are different ways of interlacing the threads for different materials. For instance, in



[Photo by Author.]

1. Woollen Yarns to be woven into goods of flannel and blanket type.
2. Worsted Yarn from fine twill suiting. The crimp in the yarn is due to its having been woven into cloth. Before weaving, this yarn is perfectly straight and even.

most flannel the weave is one weft thread over the next under the warp thread, and so on. In other materials every three or more warp threads may be passed over by the weft, for every one it goes under. After weaving, a woollen cloth is by no means finished ; a blanket, for instance, looks more like a piece of a wool-pack than a blanket as we know it. The nice soft appearance of finished woollen goods is due to the finishing processes.

The first of these is called burling and mending. Burling is the picking out of any pieces of burrs and vegetable matter which

the burring machine has failed to remove. Mending is the repairing of any defects of the weave of the material by knitting or sewing together.

Fulling is the next process. This is done by a fulling or milling machine which shrinks and interlocks all the wool fibres. This is effected by soaking the material in very soapy warm water and making it "creep" by jamming it together in a sort of crush. In olden days the woollen cloth used to be trampled underfoot while soaking in the felting liquor. After taking from the fulling machine the material is washed, to free it from soapy matter.

Tentering follows fulling. The object of tentering is to straighten out, level, and remove all creases from the material, also to stretch it out to the desired width. The sides of the material are fastened to a set of hooks which are then opened out to the required width. The machine then carries the material through a heated chamber so that the cloth is dried in this position. Care is taken not to stretch the material too much, or it would shrink back again; the operator has to accurately estimate the shrinking qualities of the material, otherwise he is likely to be out in his estimated width of the finished material.

Teasling follows tentering. Teasling is the raising of a nap on the surface of the finished cloth, as is seen in new blankets.

Blankets and other goods, while not being so soft and of such good appearance at first, would wear very much better if they were not teased, as it really takes a portion of the body out of the cloth, but a woollen manufacturer who put his material on the market without teasing would find it very difficult to sell.

Cropping follows teasing. The object of cropping is to render the nap—which was raised by the teasing machine—even and smooth. The cropping machine stretches the cloth evenly over a roller and a revolving cylinder armed with knives which cut off the irregular portion of the nap a fraction above the cloth. The distance can be regulated according to the length of nap desired.

The final process is crabbing and pressing, the object of which is to clean and level the cloth.

The cloth is brushed by roller-shaped brushes revolving against

it, and also steamed by passing it over perforated copper plates through which steam issues. After brushing and steaming the cloth is folded up and a sheet of brown paper is placed between each fold, also a piece of sheet-iron at intervals of 9 inches or so. In this state it is placed for some hours in a hydraulic press, after which it is taken out and folded. The material is then ready for the market.

WORSTEDS.

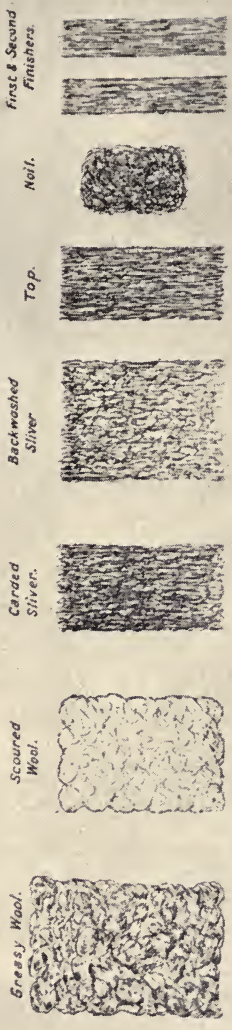
After the wool has been scoured and dried, the first process that it undergoes is willowing. Willowing shakes any sand and loose vegetable matter from the wool, and also helps to mix wools that have been blended.

Should the wool contain a good deal of burr, it is necessary to run it through a burring machine. There are several types of burring machines. Some crush the burr which is removed in the carding and combing operations that follow, though when this method is employed the noil is very dirty. The latest method is that employed by Woolcombers, Ltd., England. This is a machine which takes the place of the top divider of the carder. The wool is run on to what is called a Morel's roller. This roller is closely covered with thousands of very fine wire teeth, which allow the wool to sink down between them; the burrs, being too large to follow, remain on top of the wire teeth of the roller. As the latter revolves it comes into close contact with a six-bladed burr beater, which knocks the burrs off it into trays made to hold them. When this method of burring is employed the noil is very clean, as burrs are removed in the carding machine.

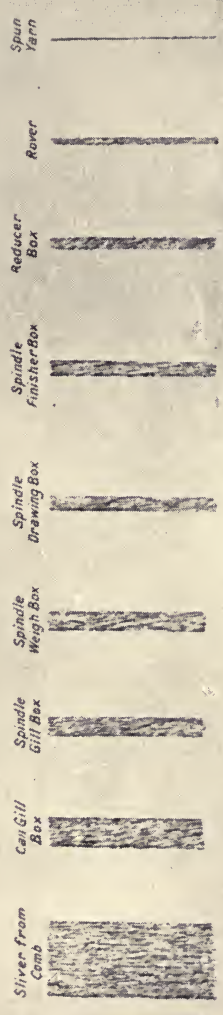
The next process is preparing or carding. Most long wools of 7 inches and up are prepared.

This is done by a preparing box which opens up the staple of the wool, combs the fibres apart, and also lays them parallel.

Short wools, such as Merino, etc., are prepared for combing by the carding machine, which leaves the wool in an even layer of



GRAPHIC ILLUSTRATIONS OF PROCESSES FROM WOOL TO TOP



GRAPHIC ILLUSTRATIONS OF PROCESSES FROM TOP TO YARN

Stages in Wool Combing and Worsted Yarn Spinning.

thoroughly mixed and opened-out fibres. After carding the wool goes through a machine called a backwasher. Backwashing is really a second scouring operation, the carded sliver being washed so as to remove any dirty matter which has escaped the first scouring. Manufacturers who do not sell their tops, but make them up into yarns and cloth, very seldom use the backwasher. The only advantage of backwashing is the improved colour of the top. The colour is very often further improved artificially by blueing. Backwashing should be done without it if possible, as it is detrimental to the wool when it is undergoing the spinning process owing to the natural oil being removed, and the heat the sliver is subjected to when being dried is inclined to make the fibres more brittle than need be.

During the process of backwashing or carding about 3 per cent. of olive oil is added to the wool or sliver. This prevents the wool from felting during the carding and following operations, besides making it softer to work.

Gilling is the next operation. The wool is put through what is called gill boxes, which lay all the fibres straight and parallel to one another, thus leaving them ready for the combing which follows.

The object of combing is to remove from the wool all the short and inferior fibres, and to straighten out and lay parallel all the remaining long ones. This is done by a combing machine. There are several types of combing machines, but the one most used by English and Colonial manufacturers is known as the "Noble Comb." The French manufacturers mostly use what is known as the "French Comb." This comb is the most economical for working short and shabby Merino wools; it is very fine in build and only removes the very short, curly fibres, leaving in the short, straight ones which most other combing machines would take out as noil. This is the reason why the French section can buy almost any of our short wasty wools and get better results from them than other manufacturers. Following combing come drawing and roving, which reduce the top or tops to a thin sliver suitable for the spinning operations which follow.

Spinning is the reducing of the drawn sliver into yarn ready for weaving into worsted cloth.

Warping follows spinning. Warping is the running of the required length of warp yarns on to a large wooden drum, from which it is run off on to a loom beam which is placed in position on the weaving loom.

Weaving is the next operation. Most worsted materials leave the loom almost in a finished state. In this they differ greatly from the woollens, which practically owe all their appearance to the finishing operations following weaving.

After weaving, burling is the next operation, which is the removal of all little pieces of vegetable matter and the mending of any broken threads. The latter is very particular work on worsted materials, as any broken threads have to be sewn neatly so that they will not show on the face of the cloth. In the case of a woollen the teasing process would hide imperfections that would be glaring faults in a worsted.

Worsteds are finished in much the same manner as the woollens, though as a rule they are not subject to teasing, as the surface of most worsteds are desired smooth, showing the weave of the material. Most worsteds are dyed in the piece—that is, in the made-up state.

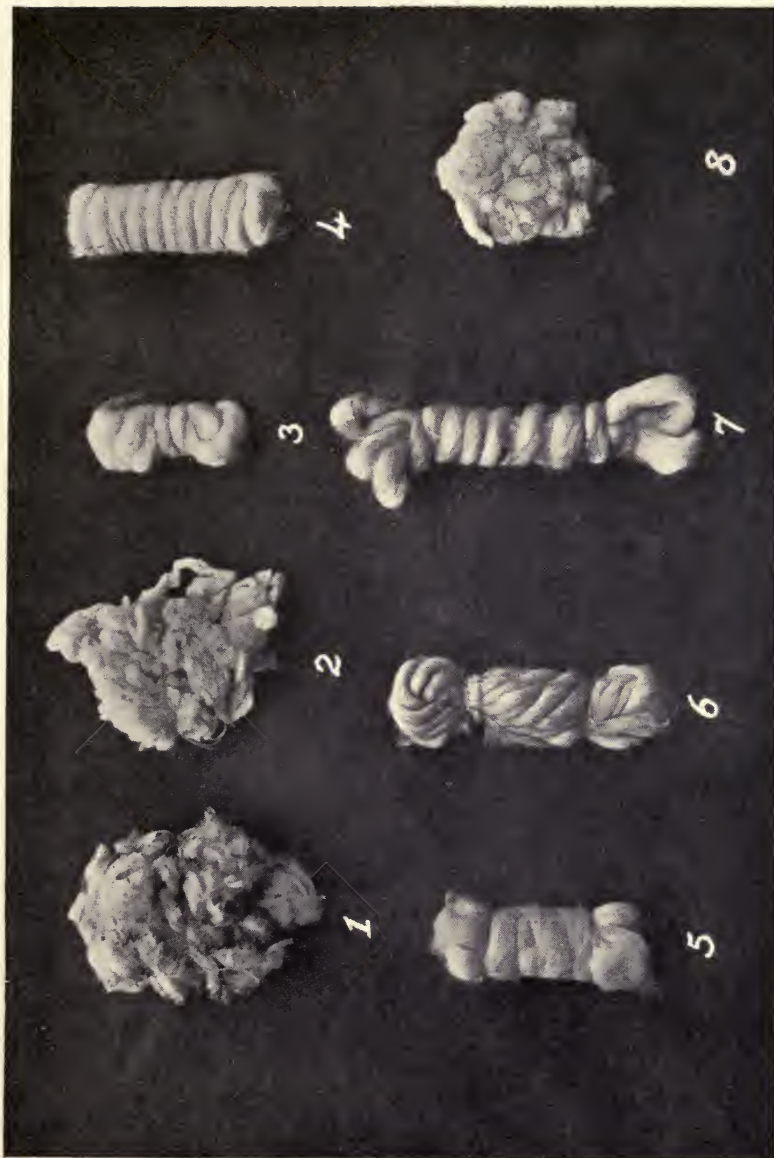
In woollen manufacture the greasy wool is generally made into the finished cloth by the manufacturer, but in the manufacture of worsted cloths the wool is generally divided up between a number of manufacturers who specialize in one particular branch of it. The wool-buyers are generally employed by the wool-combers. The combers sort and scour the greasy wool and comb it into tops and noils. The wool-combers then sell the tops to a spinner, who converts them into yarns. The spinner sells his yarns to a weaver, who weaves it into the finished article. Many fabrics have to be dyed. Most English weavers and spinners give their work out to the Bradford Dyers' Association, so there are several special industries which each help to turn out finished worsted goods. The great advantage of this method is that each manufacturer becomes a specialist in his own particular

line. A spinner can go to a topmaker and buy whatever quality of tops he requires and get them in an even, straight line, whereas if he had to buy the greasy wool and sort it himself he would have a lot of wool which would be unsuitable for the yarns he desires, and so he would have to re-sell the wool that he did not require. The topmaker generally purchases all qualities of wool and sorts it up into large even lines, and as different spinners require different qualities of tops, he has no difficulty in selling them at their market value. The weaver also benefits by this method, as he can go to a spinner and get yarn of any colour or quality he desires.

TOPS.

A little information about tops, which in the near future may become one of our very important manufactured exports, will not be out of place. As mentioned before, tops consist of combed wool, the combing removing all the short curly and irregular fibres in the form of noil, and, in addition to the removal of the noil, the remaining long fibres which the top consists of have been straightened out and laid parallel to one another. The qualities which Bradford tops are sorted and combed into vary from 28's to 100's; in some cases even finer quality tops are sorted from special lots of wool. Length of fibre as well as quality are necessary in a top to enable it to be spun to the number of counts which its quality or the diameter of its fibres denotes. What would be good-length fibres in a 60's quality top would be so short in a 40's top that it would not spin any more than 20's, though it would be a 40's quality top. This is difficult to define, but it is owing to the way the word "quality" is used.

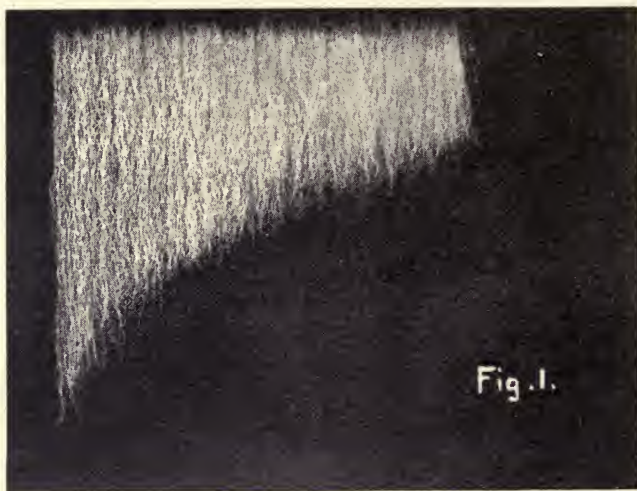
For instance, if I had to buy a line of tops for the manufacture of very fine Italian cloth, I would require a top of about 70's quality, consisting of sound fibres possessing a good length. This top should spin the number of counts that its quality denotes, viz., 70 hanks of yarn, each hank 560 yards in length, from 1 lb. weight of top. In some tops, particularly those combed by the French comb from short, shabby Merino wool, you will find wool of 70's



[Photo by Author]

1. Greasy Merino Wool. 2. Scoured Merino Wool. 3. 70's Merino Tops.
 4. 60's Merino Tops. 5. 58's Tops, Comeback quality. 6. 50's Tops, fine Cross-bred quality.
 7. 40's Tops, coarse Cross-bred quality. 8. Merino 60's quality Noils.

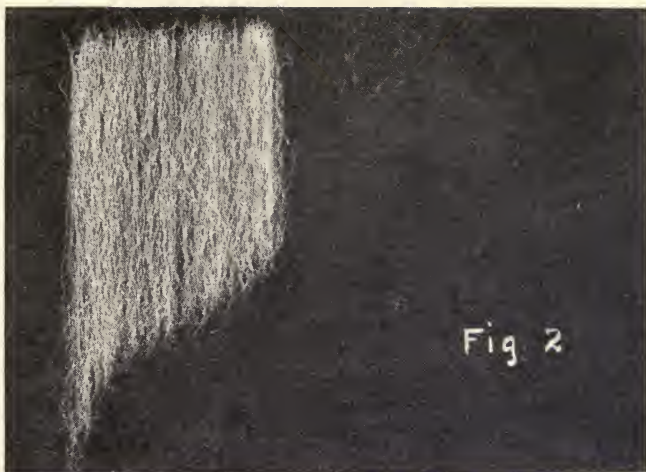
quality, but the top contains so many short fibres that you could spin no more than 50's from it, yet it is called a 70's quality top. In making a very fine Italian cloth, where the warp is cotton with a worsted wool yarn for weft, a very strong and exceedingly fine yarn is required, because the worsted wool weft yarn goes over four of the cotton warp threads for every one which it goes under. Thus the face of the cloth will consist of practically all worsted



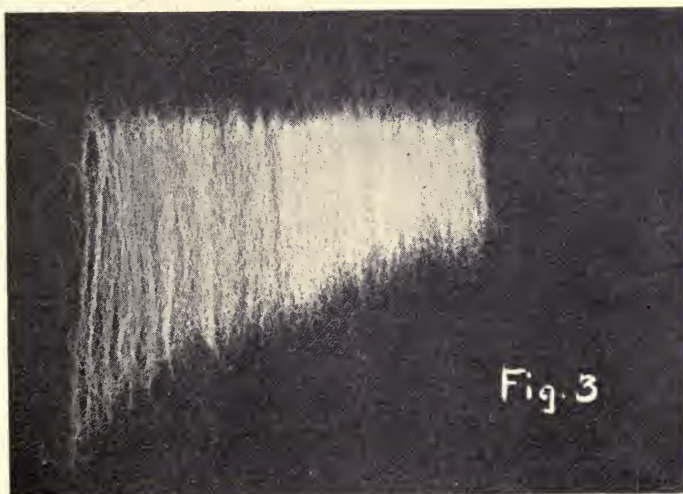
Showing the lengths of the fibres contained in a 60's quality top, the longest being $5\frac{1}{2}$ inches and the shortest being $1\frac{1}{2}$ inches. This top was combed from wool which had not been sorted, consequently only about 20 per cent. of the fibres in the top are long enough to spin out to 60's. The shorter fibres are suitable for hosiery yarn. When the fibres vary in length, as is the case in this top, it is impossible to spin them out to anything like the number of counts their quality denotes.

yarn, and any knotty or bumpy sections in it would show up at once. Therefore worsted yarns suited for this work must be very even, and this is got by spinning the yarn only from a top where the fibres are of an even and good length.

Tops are nowadays cheapened by blending in all sorts of ways. You can sometimes buy 60's tops cheaper than you would make them from the greasy wool if you bought the latter at its true



Showing the lengths of the fibres in a 60's top combed from carefully sorted wool, the longest fibres being 6 inches in length, the shortest 4 inches. This top could be spun right out—that is, it would spin 60 hanks of yarn, each 560 yards in length, or nearly 19 miles of yarn, from 1 lb. of the top.



Showing length of fibres in a French dry-combed top of 64's quality. This top has a large number of short fibres in it. It could be spun to about 50's and would make good hosiery yarns.

commercial value. Many topmakers have reduced this blending and cheapening of tops to a fine art. For this reason a good many spinners like to see the wool in the grease and get their tops made from it.

Reliable wool-combers will show their clients the sorted lines of wool in the grease, and comb the tops from the line they select.

Super 60's or 64's tops are made from wool of even quality and length, while a common 60's would consist of wools of uneven length and in some cases uneven quality as well, such as a 58's and 64's quality wool blended together, the blend resulting in a top which would be about 60's quality.

YARNS.

I will name a few of the principal yarns that are spun from tops and used in the Bradford trade.

1. **Super Botany Weft Yarns.**—These yarns are made from Australian superfine wool, such as is grown in the Western District of Victoria and Tasmania and other favoured parts of Australia. You will seldom find wool in any other part of the world to equal that grown in the districts I have named. Some years ago a Merino wool grown at Ercildoune, near Ballarat, by the late Sir Samuel Wilson, was so fine that it would spin 160's. The top lots of this wool brought 5s. per lb. in 1880. Mount Bute, another sheep station owned by the same owner, produced wool similar to that grown at Ercildoune. The finest wool obtainable in Australia at the present time would not spin more than 110's or 120's. Most evening dress suits and frock-coats are made from Super Botany weft yarns. The qualities in this yarn would vary from 70's to 110's.

Cashmere Weft Yarns.—These yarns are spun from tops varying from 50's to 90's quality. In this class of yarn tops of, say, 60's quality are often used that would not spin that number of counts. When cashmere yarn is spoken of it is generally understood to mean a yarn from 60's to 64's quality. In the textile

trade the word "cashmere" has a great variety of meanings. Originally this textile fibre came from off the Cashmere goat which is found in the north-west of India. These goats have a long, hairy fleece, which has short, soft, and silky fibres near the skin, hidden from sight by the coarse hairy growth. This fine growth is made into the famous cashmere shawls. They are very expensive, as each goat produces only about 4 oz. of this fine wool, the remainder of the fleece being coarse. Owing to the scarcity of the real cashmere fibre, very fine Merino wool has been substituted, and goods similar to the genuine cashmere are made from it. The fine twill cloths are made from this yarn. Very often these goods possess a silk or cotton warp.

2. **Botany Coating Yarns** are similar in many ways to the two former yarns. They are used for goods a shade lower and cheaper.

3. **Hosiery Yarns** are made from wool of all qualities. They differ somewhat from ordinary worsteds, as bulk in relation to weight is better than length.

As I have mentioned earlier, some tops are of 60's quality, but owing to the number of short fibres left in them, they will not spin to more than 46's. Hosiery yarns are often spun from tops of that type, as it is no advantage to spin the yarn out as fine as it will go. It is rather a disadvantage, as hosiery yarns are better thick, containing as little twist as possible. Thick yarns do not require so many turns or twists to make them the same relative strength as a finer or thinner yarn. It is of no advantage to have the fibres parallel in hosiery yarns as they are in most worsted yarns, because the bulkier they are the better. The short fibres in this yarn are no drawback, as they assist in making the fabric fuller in the finishing process. Most of the so-called cashmere socks and stockings sold in Australia and elsewhere are made from these short-fibred fine-woolled hosiery yarns. For very fine goods, super-Botany yarns are sometimes used, and beautiful smooth-surface worsted fabrics are made from them, such as the expensive singlets that are made for men's wear.

Fine Cross-bred Warp and Weft Yarns are woven into

men's coating fabrics, such as coatings and serges, etc. The quality of the wool in these yarns varies from 50's to 58's. The finer the wool the better the finish of the fabric. Weavers like this yarn spun rather low, such as 56's spun only to 46's. This gives a thicker yarn than it would if it were spun out to its top count. All the best-class coatings are made from yarn spun low, because they can be given a soft and pulled finish. In the cheaper coatings the yarn is spun out as high as it can be. The finished fabric is thinner and does not possess the wearing quality of the former.

Low Cross-bred Warp and Weft.—This yarn is made from tops of 36's and 40's quality. This is about the quality of the average Lincoln wools. Yarns of this quality generally possess a high lustre, and are made into fabrics where very bright colours are necessary, such as dress linings, etc.

Mohair is also used for this class of yarn.

CHAPTER XI

TEXTILE FIBRES

**Mohair—Alpaca—Rabbit fur—Camel's hair—Horse hair—Llama wool—
Cow hair—Silk.**

I THINK it would be of great interest to the wool student to know a little about some of the other animal textile fibres, as a good many of them are closely allied to wool, and it is difficult to say where one could draw the line between some of them and wool.

We will first take the Angora goat, or rather the **Mohair** which grows upon it. The mohair somewhat resembles the wool of the Leicester sheep. It is about the same length, and is noted for the brilliant lustre it possesses. Mohair is also very silky in appearance and soft to the touch. It is used largely in the manufacture of plushes. The lower, inferior classes of it are made into carpets, blankets, etc. It is dangerous to sort; as a rule the bales are soaked in water or steamed before opening.

Alpaca.—Alpaca is a wool which is grown by the alpaca, an animal which resembles a large goat more than a sheep. Its home is in Peru, Chili, and neighbouring countries. The wool varies in quality, but the bulk of it would be about a Bradford 50's. The average length of the fibre or staples is about 6 inches; in colour it ranges from black to white, but the latter is not very plentiful, black, brown, and grey being the colours of the bulk of alpaca wools. It is manufactured into ladies' dress material and similar goods.

Rabbit Fur.—Rabbit fur is used mostly for the manufacture of fur hats. The coarse kempy fur which is seen on the top

of the rabbit-skins is not used, as it has practically no felting properties. The short, fine, downy growth underneath the kempy fibres only is used. These short, fine, downy fibres can be seen plainly by blowing into the skin and parting the fur. Thousands of bales of rabbit-skins are exported from Australia yearly. The skins are sold by the pound. Average skins bring about 1s. per lb., but the market fluctuates considerably (see Chapter XIX).



[Photo kindly lent by Rex Blaxland, Esq.]

ANGORA GOAT.

Bred by the Wyalong Angora Stud, N.S.W. Cut 14 lb. of mohair,
worth 11d. per lb.

Camel's Hair.—Camel's hair is used in the manufacture of blankets, belting for driving machinery, and other goods. Constantinople, Persia, and other Eastern countries export considerable quantities of it.

Horse Hair.—Horse hair is divided into two sorts, mane and tail hair. The latter is made into fabrics for upholstering chairs, sofas, etc. The mane hair is used for stuffing, or the padding of railway seats, cushions, and also for making brushes.

Llama Wool.—The Llama is an animal about the size of a large deer, which it resembles somewhat. It is used as a beast of burden as well as a wool-grower in its native country. The wool is fairly coarse, and has long, kempy, hairy fibres running all through it. It is usually of a brown colour, and it is used for making coarse knitted fabrics.

Cow Hair.—Cow hair is usually blended with very low, coarse sheep's wool and spun into coarse yarns. This yarn is woven into rough and hairy materials, such as horse and cow rugs, saddle cloths, carpets, and similar goods.

Silk.—Silk differs from other animal fibres, as it does not grow on an animal as a protective covering. It is the product of a worm, which at certain periods spins the silk around itself till it is entirely covered by it. This silky covering is about the size and shape of a sparrow's egg, and is called a cocoon. The silkworm inside the cocoon then changes into a large brown grub, which again changes into a moth. The latter, if left, bores its way out of the cocoon, and mates in order to maintain its species. The moth lays a large number of very small eggs and from these are hatched small silkworms, which are fed on mulberry-leaves till they are large enough to spin themselves into a cocoon. Silk is very dear. It has a fine lustre and softness. It is made up into ladies' dress materials, underwear, and numerous other types of fabric.



BULLOCK TEAMS BRINGING DOWN WOOL FROM WESTERN NEW SOUTH WALES STATIONS.

"Manfred," "Kilfera," "Paika Lake," "Clarendon," and other well-known clips all come down this road by bullock-wagon.

CHAPTER XII

WOOL-CLASSING

Cost of classing—Selecting suitable labour—American requirements—Tender wool—Skirting the fleece—Naming sorts or classes—Suitable classes of wool for Merino sheep in the different States—Classing Merino lambs' wool—Classing Cross-bred wool—Classing farmers' and graziers' lots—Classing large farmers' clips—Classing pure-bred English long wools, such as Lincoln, Leicester, Cotswold, etc.—Treating pieces, bellies, and locks—Re-classing by wool-brokers, dealers, etc.—Mixed flocks.

WOOL-CLASSING is the preparing of wool for market in as large lines as possible, by keeping wool of the same money value and quality, as far as practicable, together. The reason for this is to enable each buyer to select a line of wool of even quality and condition, that is suitable for his requirements. Wool classed badly, such as where two or three distinct sorts are bundled together, are not valued at all by a large number of big buyers. The buyers who do purchase these mixed lots can in a good many cases re-class and put them up for sale again, making them show a profit.

Some pastoralists complain of the expense of classing wool. Now, getting wool up in a scientific manner costs from 1s. 6d. to 2s. per bale, while it adds at least $\frac{1}{2}$ d. or 1d. per lb. to its value, thus adding from 12s. 6d. to a £1 per bale to its unclassed value.

Wool-classing at the present time is done very much better, and more scientifically than it was a few years ago. Some of our Australian pastoralists spare no expense in the getting up of their wool clips. You have only to go into the sale-rooms at Sydney,

Geelong, and Melbourne, to see some of the well-known Victorian, New South Wales, and Queensland clips on show to realize what a state of perfection wool-classing has been brought to. A capable classer should be given an absolutely free hand, and have complete control of the wool from the time it leaves the sheep till it is baled up. He should also be given as many shed hands as he desires. I have seen some pastoralists work their shed underhanded, and at the finish of shearing say to the classer, "Well, you got through with that number of men all right." No doubt a classer can get through, but had he employed the extra men required he would have had the wool skirted better and his low sorts got up and attended to in a proper manner. I will quote an incident which occurred in a Victorian Western District shed, where I was employed as wool-classer. There were twelve shearers and we could only get two wool-rollers, owing to a scarcity of labour at that time. Needless to say, they could not do their work well, as we were shearing about 1,200 sheep per day. The owner of the place seemed pleased that we had got through, as he said we saved two men's wages. I examined the wool at the sale show-room and saw, as I expected, britch ends and cotted neck pieces left on the fleece wool. Knowing the broker's wool valuer, I asked him what it would take off the value. He replied, "About $\frac{1}{2}$ d. a lb." Now this pastoralist had about 270 bales of fleece, so he would lose about 12s. per bale, his total loss amounting to about £162. The two extra men which would have been sufficient to have skirted the wool in a proper manner would cost about £22, so you can see it pays to employ the necessary amount of labour to ensure your wool being well skirted and got up in a proper manner. When engaging men for shed-work, every effort should be made to employ only capable men. To make sure of getting good men it is necessary to engage them beforehand, as it is sometimes difficult to obtain a good team when you select them from the men who gather at a shed at the commencement of shearing. The wool-classer can generally procure good wool-rollers, piece-pickers, etc., and I think it is advisable in most cases to leave the selection of these men to him. Some pastoralists pay

the expenses of good wool-rollers and table hands from the city to the shed. I think it pays to do this, as one good smart wool-roller will do as much work, and do it better than two of the indifferent sort. Some manufacturers have no plant for removing burr and vegetable matter from wool, and consequently they do not purchase this wool. That is one reason why pieces should be picked or sorted in the shearing shed, as in skirting off the faulty wool from a fleece, you very often have to take off a little good free wool with it, especially on the neck skirts. The piece-pickers usually sort the skirts into three sorts—namely, firsts, seconds, and stains; the firsts consisting of all the bulky pieces free from burr; the second pieces being shorter, and having fribby edges, which are the extreme edges of the fleece. Stains would consist of urine-stained wool from the britch of the sheep. In some cases where the pieces are all burry, the firsts will consist of all the big, bulky, and light burry pieces free from all fribby edges, the seconds consisting of heavy burry and fribby edges. The fleece is skirted in order to remove all faulty wool, such as stained britch wool and the dirty pieces about the edges of the fleece, also any containing burr which does not run very deep into the fleece. In some cases if you attempted to skirt all the burry wool off the fleece, you would have hardly any free wool left, so in these circumstances it is advisable to remove only the heavy burry edges. The American buyers seldom purchase fleece wool having burry skirts left on, and if a grower had very good wool, it would pay him to skirt all the burry wool off his fleece, as the American competition will raise the value from 2d. to 4d. per lb.

The chief things to remember in classing wool are—

1. Condition.
2. Quality.
3. Strength and length of staple.
4. Colour.

Condition means the quantity of yolk and earthy matters which the fleece contains. Merino wools are chiefly classed on condition. Classing on condition means putting the fleece into three or any

number of lines which are necessary, each line of wool containing fleeces of about the same yielding power. By doing this you get all the lightest and all the heavy-conditioned fleeces in even lines, and if these lines of wool have been well and evenly classed the wool-buyer has no great trouble in estimating the yield of each different line of wool ; but if you have heavy-conditioned fleeces mixed together with the light-conditioned ones, it is very difficult for a buyer to estimate the yield correctly, and his estimation will be on the heaviest-conditioned fleeces he can find in the bale. The best of some of our pastoralists' wool may be suitable for America, but if he has mixed it with the heavy-conditioned fleeces of his clip he immediately loses that competition. At the present time the American wool importers have to pay 5½d. per lb. duty on greasy wool going into the United States, so they only purchase the very best and high-yielding wools. When they pay 5½d. on a lb. of greasy wool they want to get as much clean scoured wool as possible in that lb. of greasy wool, otherwise they are paying 5½d. per lb. duty on more grease and dirt than is necessary. For instance, if an American bought 100 lb. weight of Merino wool yielding 40 per cent. clean scoured, and paid duty on it, he would be paying 5½d. per lb. duty on 60 lb. of grease and dirt, which would be of no use to him whatever. When looking for a Merino wool he wants a line that will yield about 55 per cent. and upwards. The duty on scoured wool in the United States is 16d. per lb., which practically prohibits scoured wool altogether. The Americans purchase all qualities of wool from Lincoln to Merino. They frequently purchase our coarse wools of 40's quality (Lincoln wool) freely, and pay very high prices for them. Americans mostly buy the sound, bright, and long-stapled wools. In fact, the pick of the Australian wool usually goes to America, as they buy most of the top or super lines of all the big Victorian, New South Wales, and Tasmanian clips.

The present American President—Dr. Woodrow Wilson—and his Party are likely to remove the duty on greasy wool. Should the duty be removed or considerably lowered the American com-

petition will be spread over a larger range of our wools, which will be of benefit to farmers and others, though it will be bad for those growing high-class super wools, as the American buyers need not confine themselves solely to these good wools as at present.

The next thing in classing is the length of the staple. It is not advisable to put short-stapled wools with the longer and bulky combing wools. The strength of the fibres or staples is also of importance. Some wools have a tender staple—that is, one that will break at the weak part when subject to a light strain. Sometimes you find a distinct break in the wool, which can be seen by looking closely at the staple.

Some manufacturers cannot comb a tender wool profitably, while others have machinery more suitable for combing this type, and will readily purchase it. Tender wool should be kept by itself when possible, as if put with the sound stapled wool it would be unsuitable to a large section of the buyers and their competition would therefore be lost. Another equally important reason why it should be kept apart is that the tender wool is worth about 1d. per lb. less than the sound, providing the quality and yield are the same.

The best method for a classer to follow in testing the staple to detect tender wool is as follows : Take the extreme tip of the top end of the staple between the thumb and forefinger of the right hand, letting the middle finger rest on top of the forefinger, then take the other end of the staple between the thumb and forefinger of the left hand and smartly draw the third finger across the centre of the staple. (See diagram, p. 94.) If the staple is tender this will cause it to snap off at the weak part. Tender wool is caused by patchy seasons ; badly mixed and very strong solutions of sheep dips are also responsible for it. If the sheep have been having a bad time on poor feed, and rain starts and the grass springs up, the wool will start growing very quickly, but where it starts you will nearly always find it tender, and in cases where the change in the pastures has been from very poor country to very good you will often find a distinct break in the fibre.

Quality is another very important thing that has to be taken into consideration when classing. When the word "quality" is used in the wool trade it generally refers to the diameter of the fibre, viz., fineness or coarseness. Different wools have different spinning qualities, and each quality is used for a different class of material. A buyer who requires a fine Cross-bred wool for his yarn or cloth does not want to purchase coarse, so wool, more especially Cross-bred, requires to be classed into its respective spinning qualities, or as near to them as possible, without making



[Photo by Author.]

CORRECT WAY TO HOLD STAPLE OF WOOL WHEN
TESTING FOR SOUNDNESS.

the lines of wool too small. Cross-bred wool is classed mainly on condition and quality. Before shearing, Cross-bred sheep should be drafted into two or three sorts, say fine, medium, and coarse-woolled sheep. This will make the work much easier for the classer, and enable him to keep the low sorts, such as bellies, pieces, and locks, even. On the other hand, if Cross-bred sheep, growing wool of all qualities, are shorn together, you get wool of every quality in the pieces, bellies, and locks, and it is very difficult to get the average shed hand to grade them properly, as he possesses little or no knowledge of wool qualities.

Colour is also another very important point in wool-classing, though very often condition and colour go together. Brightest fleeces are generally the lightest in condition, and when you get an exceptionally heavy fleece it is in most cases a yellow or canary colour, which in the trade is called "dingy," though you can get white fleeces that are very heavy-conditioned. Rams' wool is often very white, but it is usually very heavy. In most shearing sheds you will get "dingy wool"; some places have very little of it, while others have a great deal. This class of wool should be kept by itself, and not put with the whiter and brighter wool. There are several varieties of discoloured wools, the chief causes being excess of yolk, tick, and fern stains, also charcoaly wool off burnt and scrubby country. A fleece containing an excess of yolk is yellowish in colour and very heavy, though it will generally scour perfectly white. Tick stains on wool are caused by the parasite of that name. These stains, if bad, will not scour out. Ticky wool is very dirty and of a dull colour, inclined to be dingy, and usually possessing a tender and very thin staple; it also has a very offensive smell, and the tick eggs can be seen all through the wool. They resemble large grape-nuts, and are dark in colour. Dipping the sheep is one of the best means of doing away with this pest. Fern stains are generally found on sheep which have been grazing on bracken fern country. The stain is generally in the wool on the back of the sheep, and very much resembles iron-rust. Though it is called fern stain, I think it is got through the sheep sheltering under certain trees during rain, and this gummy stain drips on to them from the branches of the wet tree. Charcoal is another stain; wool stained by this is very black-looking and in classing it should be kept separate from the wool off clean country. Charcoal makes the wool very soft and "kind" to the touch. It is generally very light-conditioned wool, and is often bought by the Americans on this account. It is nearly always free from burr. Charcoal-stained wool will not scour perfectly white, but retains a bluish tinge.

Black and grey wool should never be mixed in any way with white, and when a black or grey-woolled sheep is being shorn the

boy brooming, or the picker-up, should be made to sweep it all together, leaving no particle of it on the shearing board. It is a good plan to have a few wool-packs fastened up in the shed for holding black wool and other odd fleeces. They can then be kept by themselves till the end of shearing and baled up as the classer orders.

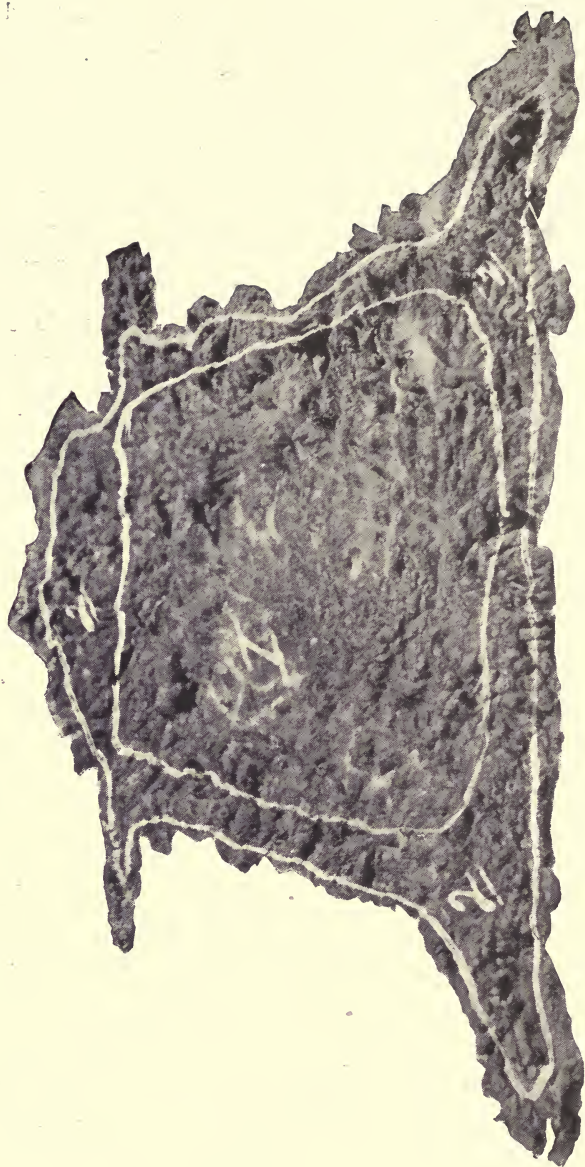
Canary stain is a stain found in Queensland wools. It is a pale yellow in colour, and it cannot be scoured out of the wool.

To ensure a clip being put on the market in an up-to-date and proper manner, the pastoralist should give the classer every assistance in his power. He should see that all dust is kept down by a liberal use of the watering-can on the races and yards adjoining the sheds. Sheep soon loosen and powder the earth about a shed, and I have often seen sheep going to the shed surrounded with clouds of dust. The sheep have been on clean country all the year, and the wool is clean right to the tip, but it is getting dusty and dirty at the last moment through want of a little care. In the back-country, where water is scarce, the ground in the sheep-yards and races cannot be kept damp, but the sheep should be driven as quietly as possible into the shed to prevent dust from rising.

On large stations the sheep of different ages and sex are kept in separate paddocks. Each flock should be brought into a shed and shorn separately. This will make it much easier for the classer, and enable him to keep his sorts even. If the sheep are brought in, and shorn with old ewes and hoggets all mixed together, it is almost impossible for the classer to get the wool up in even lines. In most cases the hogget wool is worth about $\frac{1}{2}$ d. to 1d. per lb. more than that shorn off old sheep. One of the first things the classer has to do is to arrange the piece-picking and rolling tables, and see that they are in their proper places, as they are very often removed after previous shearing and stacked in some corner of the shed. The next thing he has to attend to is the placing of the shed hands. A good deal depends on these men and the way they are managed. If they get out of hand at the start of shearing, they will generally

finish that way—just doing things their own way instead of yours. A young classer must learn how to manage men, as his success depends on the way these men do their work. When the first fleeces come up to the table he should go up and show the shed hands exactly what he wants to do with the wool. It is one of the shed overseer's duties to see that the fleeces are picked up and delivered to the wool tables in a proper manner. If they are not the classer should inform the shed overseer and tell him how he wants the fleeces thrown.

As I have mentioned in the chapter on Shearing, a lot depends on the throwing out of the fleece, because, if well done, the wool-rollers or skirters can do their work quickly and correctly. If, on the other hand, the fleece is badly thrown, the skirters do not know where to begin. They start pulling off faulty pieces wherever they can see them. Besides, it cannot be done well, and it takes about treble the time to skirt a badly thrown fleece that it does to skirt one that is thrown out correctly. The first thing the skirters should do is to cut off the britch wool as deep as the classer instructs them. The wool skirted off a fleece should be faulty wool, otherwise it should not be taken off, though in some cases, especially on the neck of some fleeces, it is necessary to take off a little good wool, as it is mixed up amongst the cotted neck wool. The britch wool is usually coarser than the rest of the fleece, and when the sheep are pastured on burry country this portion of the fleece contains a good deal of burr. All the burry wool should be taken off, unless, as I have mentioned earlier, the bulk of the fleece is burry. In that case only the heaviest of it should be removed. The britch wool which the skirters have taken off should be thrown into a basket or on the floor at the end of the rolling table, and on no account should it be mixed up with the neck or other skirts, as it would make it much more difficult for the piece-pickers to sort. The skirter should then skirt up the sides of the fleece, taking the wool off as deep as the classer instructs, till he comes to the neck of the fleece. Neck wool has to be taken off in different ways, according to the class of country the sheep have been on. Sheep

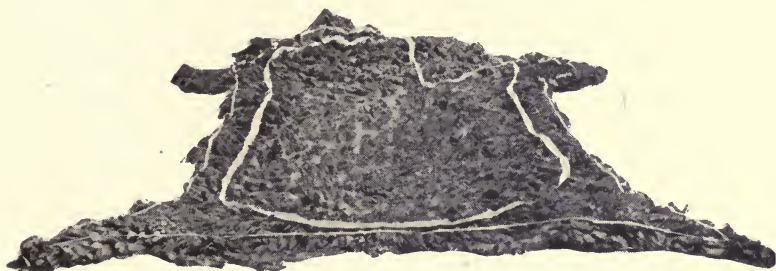


[Photo by Author.]

EXAMPLES OF LIGHT AND HEAVY SKIRTING,

The outside lines representing light skirtings, the inside heavy skirting, and cutting neck across.

on good grass country generally have cotted lumps of wool on the neck. The way to skirt this off is to cut the neck wool straight across. (See diagram.) The neck wool from sheep that have been grazing on saltbush and scrubby country should be taken out in a different manner. Sheep off this class of country have a sticky neck, these sticks consisting of short broken twigs, etc., in the wool. They form a V-shape in the centre of the neck. These necks do not usually contain any cotted wool like the sheep on grass country. If you cut these necks right across you would be taking a large amount of good shoulder wool



[Photo by Author.]

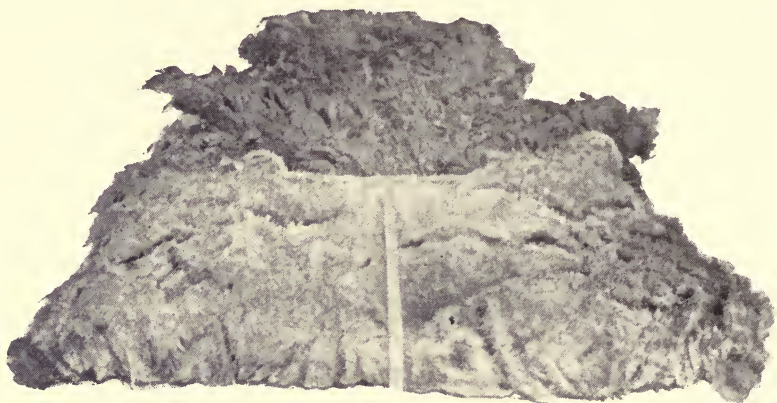
METHOD OF SKIRTING MERINO BACK-COUNTRY FLEECES.

The wool outside the first lines would be the second pieces with the exception of the stained wool on britch. The wool between the inside and outside lines would be the first pieces. The wool inside the second lines would consist of good fleece wool, though in some cases it would be advisable to take out the wool in centre of back, especially if the sheep were grazing on sandy country. The wool inside the V-shape would consist of sticky neck wool.

with them. To avoid this, the neck must be skirted round lightly and the sticky parts taken out in a V-shape. In doing the neck in this manner you get all the faulty wool off, without taking any of the good shoulder wool with it. (See diagram.)

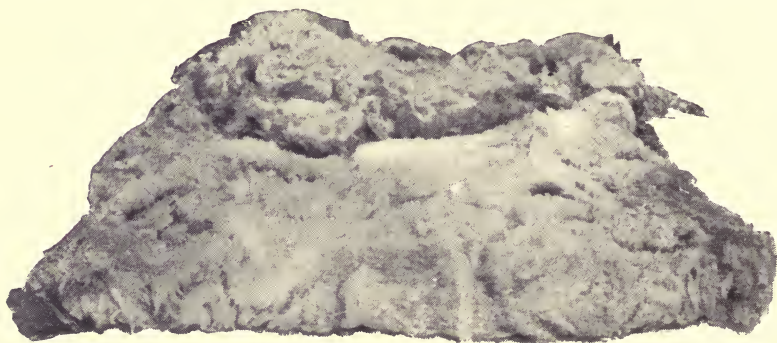
The fleece is now ready for rolling. There are several ways of rolling a fleece. I will not go into them all, but will give a description of the one I consider the best, because it will show most of the shoulder wool. The two rollers should take hold of the britch end of the fleece and fold it over till the end is in about the centre

of the fleece (see diagram), the cut ends of the part thrown in being uppermost. Now take the neck portion in the same way, but do not fold it over too deep. The more you lap in of this portion the more good shoulder wool you are keeping from view



FIRST POSITION : ROLLING THE FLEECE.

[Photo by Author.]



SECOND POSITION : ROLLING THE FLEECE.

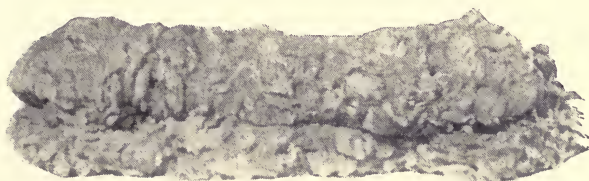
[Photo by Author.]

(see diagram). The two sides are then thrown in towards the centre (see illustration), and then the fleece is lapped over again, one side on top of the other (as diagram). The fleece is now rolled from the britch towards the neck (see illustration). Rolling the fleece in this manner will show the best of the



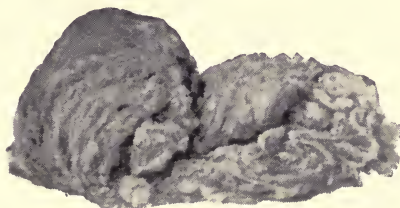
[Photo by Author.]

THIRD POSITION : ROLLING THE FLEECE.



[Photo by Author.]

FOURTH POSITION : ROLLING THE FLEECE.



[Photo by Author.]

FIFTH POSITION : ROLLING THE FLEECE.

shoulder wool. No twine should be used to tie up the fleece. In fact, no tying is necessary, though in cases where the wool is handled a great deal it can be fastened by pulling a portion of the wool out of one end of the rolled fleece and twisting it into a thick, rope-like strand, then stretching it over a portion of the fleece, and fastening it by inserting it in the fleece again. The roller nearest the classer's table should take the rolled and skirted fleece to him.

In skirting wool which has been grown on red sandy plain country, such as Broken Hill District, the north of South Australia, and other places, the sand gets down to the flesh end of fibres and causes the wool on the back of some of the sheep to become open and musty, especially if the wool is very fine Merino. This heavy sandy back wool is very low yielding, as it loses anything from 60 to 75 per cent. during scouring. In cases like this the back wool must be taken out by the skilters, and a separate sort made of them. Care should be taken so that no good wool is with it. The young classer has to use a good deal of judgment in making his lines of fleece wool, as there are such a large number of different types of Merino and Cross-bred wools, such as the bright clean wool off good grass country, the red sandy Merino wools from western New South Wales and the north of South Australia, also earthy and tick-stained wools from all over the States. South Australia has a distinct type of strong-fibred Merino wool which varies a good deal in quality in some flocks. The number of sheep has also to be taken into consideration, as you can make a good many more sorts of fleece wool on a large station than on a small place ; if you made too many classes of wool on a small station the lines would not be large enough.

In regard to branding wool, that is, naming the different sorts, etc., the brand should be as descriptive as possible. For instance, you should not brand a big, bulky wool "Clothing," this name meaning a short-stapled fine-crimpled wool. Some buyers will not purchase anything with a second on it, as it means a rather low sort, and they have instructions not to purchase these wools, and as one station's seconds may be a good deal better than another's firsts, letters instead of figures should be used to make

distinction between the various classes. I will give a list of sorts of fleece wool that I have found suitable for the different types of stations in Victoria, South Australia, New South Wales, and Queensland.

I will first take a back-country station where they have the average fine to medium-woolled Merino sheep. By back-country I mean western New South Wales, including Broken Hill, Wilcannia, and Balranald Districts, also northern South Australia, West Australia, Queensland, and any other places that grow the fine to medium quality Merino wools.

- A.A. Comb.**—This line consists of all the longest, sound-stapled, light-conditioned, bright, and fine fleeces.
- A. Comb.**—Consists of wool similar to A.A. only heavier in condition, duller, containing more sand or dust, the value about 1d. or $\frac{3}{4}$ d. per lb. below the A.A.
- A.A. Cloth.**—Consisting of all the short, sound-stapled, light-conditioned, fine-fibred fleeces.
- A. Cloth.**—Consisting of fleeces similar to the A.A. cloth, but containing more yolk, etc., and black-tipped fleeces.

If a portion of the clip is tender it must be kept separate from the sound wool. Therefore it would be necessary to make another line of it. In some instances, owing to bad seasons, a very large proportion of a clip will be tender. In this case the classer should make it into two lines, though in most cases one line of tender wool will generally be found sufficient. Tender wools could be branded as follows :—

- A.A. Fleece.**—Consisting of all the bright, light-conditioned, and long-stapled fleeces.
- A. Fleece.**—Consisting of all the heavy-conditioned and dull, tender fleeces.

The classer will always find a few odd fleeces that will not match with any of the lines I have named. These are put into what is called a cast sort—that is, a sort containing all odd fleeces, two years' growth fleeces, etc. I have named all the classes of wool that it is necessary to make on the average fine to medium Merino back-country sheep stations. The classer should remember to make as few sorts as he possibly can, and he will find that 80 per



STATION HOMESTEAD IN THE BACK-COUNTRY.

cent. of the wool will go into the first four lines I have mentioned. In fact, he may find that he can put the whole clip into them without making the lines uneven, as in a good season he will not find very much tender wool. All rams' fleeces should be kept by themselves. If there is any quantity of them, two classes could be made—a light and heavy-conditioned one.

We will next take the clip from a strong-woolled Merino flock, the type of Merino that most of the South Australian pastoralists favour. The wool off these sheep is noted for its great length of staple. It is rather coarse-fibred, but possesses all the necessary qualities of a first-class combing wool. You will not get many of the short-stapled clothing fleeces that I have mentioned in the classes suitable for a station where they have the fine-woolled Merino. Though most of these strong-woolled flocks are in South Australia, you will often find them in New South Wales and Western Australia, the latter place having gone in for this type of Merino very much during the last few years. This coarse Merino wool varies in quality a good deal, and it has to be classed into fine and coarse sorts of fleece.

I would advise the classer to make the following lines of his fleece wool, as I have found them suitable for a strong-woolled clip.

A.A. Comb.—Consisting of all the bright, lightest, finest, and long sound-stapled fleeces.

A. Comb.—Consisting of similar wool to the A.A. Comb, heavier-conditioned, duller, value about 1d. per lb. under the A.A.

B.B. Comb.—Consisting of all the lightest, strong-fibred, sound-stapled fleeces of about 58's quality.

B. Comb.—Consisting of similar wool to B.B. only heavier in condition, duller, etc.

A. Fleece.—Consisting of all tender fleeces. If there is any great quantity of tender wool it would be advisable to make two sorts—a light and a heavy-conditioned line.

The classer will find a few fleeces that are too coarse to go into the B.B. or B. Comb lines. He should keep them together till the end of shearing, also any other odd fleeces that will not fit into any of the regular lines. Great care should be taken by the wool-classer when grading this wool, as I have often seen a classer put a fleece into his B.B. line because it is big and bulky. Very often

these big, bulky fleeces are fairly fine in the fibre, and the right place for them is in the A.A. Comb, which should be the top line of wool. By putting fleeces that are fine but bulky into the B.B. Comb it will very often bring a higher price than the A.A., but if the grading is well done as regards the actual quality—that is, grading the fleece according to the diameter of the fibres and not on the size of the fleece as some classers appear to do—the A.A. will bring the top price in nine cases out of ten. The big, bulky, fine fleeces look very “starey” when just shorn, and the inexperienced classer often mistakes this for coarseness, though these fleeces look very much finer after they have been baled up for a short time.

We will now take a high-class Merino clip such as is grown in the Western District of Victoria, Tasmania, and some portions of the Riverina District of New South Wales.

I consider these high-class wools most difficult to class, as they are suitable for the American buyers' requirements who are very particular about the way the wool is skirted and graded, and the general get-up of the clip. An experienced classer usually has charge of these sheds, as the lines of wool run very close to one another, and if a poor tradesman is employed failure is practically certain. Some of the Victorian Western District sheds have exceptionally high-class wool; as a matter of fact, the best wool grown in the world comes from the Western District of Victoria. The following sheds—Blackwood, Langi Kal Kal, Mount Bute, Carham—all grow wool which has brought over 20 pence per lb. in the grease when sold in the Geelong and Melbourne wool markets. Below is a copy of the lines of fleece wool made on Langi Kal Kal in seasons 1910-11 and the prices brought by the different lines :—

7	bales	Greasy	Super lambs'	...	...	...	...	at 27d. per lb.
15	"	"	First lambs'	...	...	...	"	25d. "
10	"	"	Second lambs	...	...	...	"	17d. "
8	"	"	A.A. Super Combing	...	...	...	"	18½d. "
7	"	"	A. Super Combing	...	...	...	"	17½d. "
22	"	"	Super Comb.	...	...	...	"	16½d. "
10	"	"	First Comb.	...	...	...	"	15½d. "

In classing wool of the above type one can brand very high. The pastoralist generally likes six or seven bales of the very best wool picked out so that they will bring a very high price. For stations growing wool similar to those I have mentioned I think the following sorts will be found suitable :—

- Extra Super Comb.**—Consisting of all the longest, sound-stapled, lightest-conditioned, bright, fine fleeces, the pick of the wool from the whole flock.
- Super Comb.**—Consisting of all the fleeces a little shorter in the staple than the Extra Super Comb. This line should contain all those very light-conditioned fleeces that are too short in the staple for the Extra Super line.
- First Comb.**—Consisting of all the heavier-conditioned fleeces having a fair length of staple, value about 1d. per lb. less than the Super Comb. line.
- Comb.**—Consisting of all the shorter stapled, tippy, and heavy-conditioned fleeces.
- Fleece.**—Consisting of all tender wools. If you get enough of this wool to make two lines it will be advisable to make the two sorts, a light and a heavy-conditioned lot, calling them A.A. FLEECE and A. FLEECE.

You do not get very much inferior wool on the high-class stations, as they cull their sheep very heavy to keep their flocks up to a high standard. In some cases it would be necessary to make a cast sort containing any dingy or coarse-fibred fleeces that will not go into the other lines. In regard to the Extra Super Wool, any lot bearing that brand should be perfect wool of its type.

We will now take a Merino clip such as the average Victorian Western District station produces, also Tasmania, and the Riverina District of New South Wales, where the wool grown is a little heavier in condition than the places I have mentioned earlier. I think the following lines will be found suitable for this type of station :—

- Super Comb.**—Consisting of all the lightest-conditioned, bright, fine fleeces possessing a good length of staple.
- A.A. Comb.**—Consisting of all the heavier-conditioned fleeces having a good length of staple.
- A. Comb.**—Consisting of all the shorter and heavier-conditioned fleeces, duller, thin-stapled, etc. This line should be kept free from any dingy or discoloured wools.
- First Fleece.**—Consisting of tender and very short staple fleeces, provided they are not too heavy in condition.
- Fleece.**—A cast sort for any dingy or discoloured wools or any very heavy conditioned, tender fleeces.

PREPARING MERINO LAMBS' WOOL FOR MARKET.

Before commencing to shear lambs' wool all the tables on which it is to be sorted and classed must be covered over with a sheet ; a good strong calico or hessian sheet is generally used. This is done to prevent the lambs' wool from falling through the spaces between the table, as the staple of lambs' wool is much shorter than that of the older sheep. A very important thing, and one that a great many classers do not bother about, is the way the lambs' wool is brought to the tables from the shearing board. When the belly wool is taken off, also the short, fribby, yolky wool from the insides of the leg and crutch, the boy brooming should be made to sweep it away from the shearer and place it in a basket, so that the remainder of the fleece will not get mixed with it. This is very important, because if this low wool is kept away from the bulk of the fleece, the sorters or lamb-pickers can do their work much faster and better. All the belly and low wool which has been swept away is brought up to a table and the stained wool and dags taken out of it. This wool will then go straight into the seconds lambs, which is branded "A. Lambs'."

No picker-up should be allowed to bring up two or three fleeces together. Lambs' wool is picked up from the shearing floor by getting it between two boards, and if more than one fleece is picked up at the same time it mixes them together and makes it more difficult for the lamb-pickers to sort. In picking or sorting lambs' wool on the station, the sorter should take the bulkiest and lightest wool out of each fleece, which will make the top line. This portion of the lambs' fleece is taken out by lifting the bulk of it with the two hands, as the illustration shows. What little is left can then be quickly picked out, the remaining portion of the fleece consisting mostly of seconds. I have seen lamb-pickers on the station spread the fleece out. This is a slow and difficult way, as Merino lambs seldom hang together, and it is best to disturb them as little as possible, as the free lamb is generally all together when it arrives at the table, and spreading it out only mixes the burry portion of the wool through the free. The spreading out of

the lambs' fleece is an advantage only when you have very bulky Merino summer or cross-bred lambs' fleeces, which are more like the fleeces off older sheep.

After the firsts, consisting of the bulky free wool, have been picked out of the fleece, the remaining portion will consist of burry wool, with a little stained, and dags. The stained wool should be picked out of the burry, and all dags taken from it. The burry lambs will then go into the seconds or "A. Lambs'."



[Photo by Author.]

SORTING MERINO LAMBS' WOOL ON STATION . . . . .	109

The stains are kept by themselves. If they are very short and dirty they can be blended in with the locks, which are short fribby bits and second cuts, swept up after the shearer has finished shearing the sheep. Lambs' wool is often covered with coarse hairs called mother hair. This hairy wool looks very nice, and is much brighter than the other lambs' wool, but it should never be allowed to go into the top line, because lambs' wool with this hair through it is generally about 2d. per lb. under the value of the other. If you do not get sufficient of this hairy lambs' wool to



MERINO EWES AND LAMBS ON SALT-BUSH COUNTRY, WESTERN NEW SOUTH WALES.

make a bale, it should be put into the seconds lambs'. Lambs' wool varies a great deal in different localities. I will first give the sorts, or lines, that are necessary on a Merino station in the red sandy country.

- A. A. Lambs'.**—Consisting of all the long-stapled and bright, fine lambs', free from burr and seed, if possible.
- A. Lambs'.**—Consisting of all the shorter, burry, or seedy lambs', including the belly wool.
- Lambs'.**—Consisting of stained lambs' and lamb locks. This line should be kept free from dags.
- B. Lambs'.**—This line should consist of all the long hairy lambs' wool. The stained wool should be taken out of this line. The rest could go together, and if there was not sufficient to make a bale it could be put into the A. Lambs'.

In the line of A.A. Lambs' it might not be possible to keep them free from burr or seed, as in a bad season the whole of the fleece will be seedy. In cases like this the line will consist of all the light, seedy lambs' wool, the seconds containing heavy seed, and so on.

We will next take the lambs' wool such as is grown in the Southern Riverina, Tasmania, and Victoria, where the wool is grown on clean grass country. On the average station in these districts the sorts I have mentioned earlier will be found suitable. On places where they have exceptionally fine and light-conditioned wool it is advisable to make a line of super lambs'. If the classer has good shed hands they can soon be taught to pick out this super wool from the other. When a Super fleece is brought to the table, the firsts should be taken out just the same as is done with the other fleeces. The seconds of it go into the same line as the seconds from the other wool, but the firsts of these super fleeces are kept separate from the other, and taken up to the classer's table, where he can overlook it himself and take anything undesirable out of it.

A super lamb's fleece stands out from the others by its length of staple, lustre, and lightness. Very often the kempy fleeces of lambs' wool, which I have mentioned earlier, possess this lustre and lightness, and a novice or inexperienced classer might mistake

these fleeces for super wool. The wool-rollers are generally employed picking the lambs' wool, and as there are no pieces to sort, the piece-pickers can also be employed. These men can be put on as overlookers—that is, going over the first lambs', that the wool-rollers have picked out, and taking out any burry staples or seconds that have been overlooked. Some of them can also be kept overlooking the seconds, and taking out any stained wool or dags that the others may have left in. By doing this the lambs' wool ought to arrive at the sale-rooms faultless as regards the get-up. The classer, when not overlooking the super lambs' wool, should walk around and see that every one is doing the work to his satisfaction, also that the boys brooming sweep the belly and crutch wool away as soon as the shearers take it off.

CLASSING CROSS-BRED WOOL.

Cross-bred wool differs very much from Merino. The latter type does not vary a great deal in quality; that is, the diameter fibres are very even throughout the whole clip. In Cross-bred wool the diameter of the fibres varies greatly. Some of the sheep have wool almost as fine as Merino, while others grow wool which resembles hair as much as wool. Cross-bred wool also contains more qualities in each individual fleece than the Merino. Breeders of Cross-bred wool know how difficult it is to breed an even type of wool, and most of them admit they cannot breed a line of sheep that will grow them wool of, say, 56's or 58's quality throughout, though some pastoralists claim to have bred flocks that will produce an even line of fine Cross-bred wool. In the majority of cases their flocks are kept even by extensive culling of any sheep that are not the desired quality, not through breeding. They may in time be able to breed a majority of the type of Cross-bred sheep they desire. Cross-bred wool is produced in the first place by crossing two distinct breeds of sheep, such as a Lincoln ram and a Merino ewe. The progeny will be a sheep growing wool not as coarse as the Lincoln or as fine as the Merino. Sometimes the progeny resemble the sire more than the ewe, and vice versa.

Cross-bred wool is much more difficult to class or sort than Merino, more especially if a flock of mixed Cross-bred sheep are brought into the shed together. They should, as I have mentioned before, be drafted before shearing into fine, medium, and coarse-woolled sheep, and each class shorn separately. This will ensure an even line of bellies, pieces, and locks ; whereas if all are shorn together, you will have fine and coarse bellies, pieces, and locks all mixed up together, and the average shed hand cannot sort them satisfactorily. The classer would also have such a large number of sorts of fleece wool that it would be difficult to find bins for them all, each sort would come so slowly, and the pressers would have a good deal of idle time through the work coming in rushes instead of at a nice even gait. To class Cross-bred wool in a proper manner, it is necessary that the counts, or spinning qualities of the wool, should be understood by the classer. In Australian Cross-bred wool the counts vary from 58's—a fine Comeback wool—to 36's, which is very coarse Lincoln wool. The counts between these two qualities are as follows :—

- 58's Comeback wool, a shade coarser than Merino.
- 56's Quarter-bred wool, or fine Cross-bred wool.
- 50's Half-bred wool, just between Merino and Lincoln qualities.
- 46's Three-quarters-bred wool, a coarse Cross-bred wool.
- 40's Average Lincoln or Leicester wool.
- 36's Very coarse Lincoln wool.

Cross-bred sheep are not spread over Australia like the Merino, but are confined to the more settled districts where the country is rich. Cross-breds do not thrive on very poor country where the feed is scarce and scattered. In fact, very few Cross-bred sheep would live on Central Australian pastures ; therefore we do not find so many different types as is the case with the Merino.

In the average Cross-bred shed the following sorts of fleece wool will be found suitable :—

- A.A. Comeback.**—Consisting of all the fine, light-conditioned fleeces possessing a long, sound staple, the quality being from 56's to 58's inclusive.
- A.A. Cross-bred.**—Consisting of fleeces similar to the A.A. Comeback in all respects save quality. This should be about 50's.

- B.B. Cross-bred.**—Consisting of all the bright, long, sound-stapled fleeces, light-conditioned, etc., the quality being about 46's.
- A. Comeback.**—Consisting of all fleeces of 58's to 56's quality, heavy in condition, dull, etc. This line is a second to the A.A. Comeback.
- A. Cross-bred.**—Consisting of heavy-conditioned or shorter-stapled dull fleeces of 50's quality. This line is a second to the A.A. Cross-bred.
- B. Cross-bred.**—Consisting of all the heavier-conditioned or short-stapled and dull fleeces of 46's quality.
- Lincoln.**—All the pure-bred long wools could go together, though any cotted or hairy fleeces could be kept out. In the average Cross-bred shed you will not get very much Lincoln or Leicester wool. What there is of it is generally taken off the rams.

If the station does not possess enough sheep to make lines of the above sorts, they could be cut down by putting the A. Comeback and the A. Cross-bred together, these two lines consisting of the seconds of the A.A. Comeback and A.A. Cross-bred.

The above sorts will be found sufficient in most cases. The exceptions are where portions of the clip are tender. If the bulk of the wool is tender it is best to ignore this fault altogether and class as if it were not there, taking care, however, to keep out any fleeces that have a decided break in them. If, however, only a portion of the wool is tender, it would be advisable to make two or three sorts of this type. These would consist of a fine, medium, and a coarse line, and they could be branded as follows:—

- Cross-bred A.**—Consisting of all the fine Cross-bred tender fleeces of 58's and 56's quality.
- Medium Cross-bred Fleece.**—Consisting of tender fleeces of 50's quality.
- Cross-bred Fleece.**—Consisting of all the tender Cross-bred fleeces of 46's quality.

On stations where they have a flock the bulk of which consists of fine Cross-bred sheep, one can make lines of wool which are more suitable than the lines I have described as best suited for the average Cross-bred station. There are several stations of the fine Cross-bred type in New Zealand, and most of the large Victorian and Tasmanian stations go in for the fine Cross-bred sheep. On stations of this type you will not find a great deal of coarse

Cross-bred wool, and I think the following classes of fleece wool will be found suitable :—

Super Comeback.—Consisting of all the long, sound-stapled fleeces, very light-conditioned, bright, of 58's quality.

A. A. Comeback.—Consisting of all the shorter sound-stapled, light-conditioned fleeces of 56's to 58's quality.

Super Cross-bred.—Consisting of all the very bright and long, sound-stapled fleeces of 50's quality.

A. A. Cross-bred.—Consisting of all the light-conditioned shorter-stapled fleeces of 50's quality.

A. Comeback.—Consisting of all the heavy-conditioned fleeces of 50's to 68's quality, being heavy in condition, dull, etc.

Comeback Fleece.—Consisting of all tender fleeces of 50's to 58's quality. If necessary you could make two lines of this tender wool, calling it **COMEBACK FLEECE** and **CROSS-BRED FLEECE**.

Any fleeces that are stronger than 50's, such as 46's, and any pure-bred Lincoln or Leicester wools could be kept together till the end of shearing and made into two lines, firsts and seconds, keeping the Lincoln or Leicester fleeces by themselves. In branding Cross-bred wool many competent classers use a brand denoting the type of sheep the wool is shorn from, such as half-bred, three-quarters, etc.

CLASSING CROSS-BRED LAMBS' WOOL.

Cross-bred lambs' wool varies in quality just the same as the fleece wool, and it has to be classed on quality, that is, fineness and coarseness, as well as condition, as it would not do to put the firsts out of a coarse fleece along with the firsts of a fine one. The sorting of each individual fleece is done in the same manner as I have described for the Merino lambs' wool : the firsts of each fleece consisting of all the long and bright-stapled wool free from burr ; the seconds, consisting of the belly and burry edges of the fleece ; the thirds consisting of stained wool and lambs' locks, free from dags. A Cross-bred lambs' fleece is usually bulky. In fact, this wool is often combed in the same manner as ordinary fleece wool.

The wool-rollers, or the men employed at the tables sorting the

lambs' wool, can be instructed and shown how to keep the firsts and seconds of a fine lamb's fleece separate from the firsts and seconds of a coarse one. The following lines will be found suitable for the average flock of Cross-bred lambs :—

- A.A. Lambs.**—Consisting of all the firsts of the fine Cross-bred lambs' of 56's to 58's quality, long-stapled, bright and free from burr or seed, when possible.
- A. Cross-bred Lambs'.**—Consisting of the firsts out of the Cross-bred lambs' fleeces of 46's to 50's quality, long-stapled, bright, and free from burr or seed, when possible.
- B. Cross-bred Lambs.**—Consisting of all the seconds of the A. CROSS-BRED LAMBS, also the seconds of the A.A. line.

The A. Cross-bred line should not contain any of the pure-bred long lambs' wool, such as Lincoln, etc. Any lambs' wool off the latter type of sheep is too coarse and should be kept by itself. The B. Cross-bred lambs' should also be kept free from all stained lambs' and dags.

Lambs'.—Consisting of all the short, stained, fatty and fribby ends, and lambs' locks. This line of wool could be blended in with the ordinary locks, putting the bulkier stains in with the ordinary stained pieces.

In the Cross-bred lambs' I have advised putting the seconds of the fine and coarse lambs' together. This is necessary in most cases, but if you could get lines of each individual sort it would be much better to keep the fine separate. Then you would have a line of fine seconds and one of coarse also. The coarse seconds could be branded C. CROSS-BRED LAMBS.

The classer should watch and see the manner in which the lambs' fleeces are delivered to the tables by the picker-up. In most cases I have noticed that the boy or man picking up scoops the fleece up between the two boards and places it upon the table just as he had got it from the shearing board. If done this way the wrong side of the fleece is placed before the lamb-picker—that is, the cut ends of the staple are uppermost. It is very difficult to sort Cross-bred lambs' wool properly and quickly with the fleece in that position ; besides, all the burry wool looks just the same

as the free when viewed from the cut end of staples. The picker-up should always reverse his boards, so that the right side of the fleece is uppermost. The good, free lambs' wool can be seen at once and taken out correctly and quickly. You then have the burry wool, also the stains and locks, left. The two latter sorts are then taken away from the burry wool, and you will now have divided the fleece into three sorts, consisting of firsts, seconds, and stained lambs' and locks. The classer should, when possible, have the firsts of every fleece brought up to him. He can then class each fleece himself, placing it in the fine or coarse, or pure-bred long wool, such as Lincoln, etc., or Super lambs', if he is making a class of that wool. When he has got the lamb-sorters sorting to his satisfaction he will have no trouble, as his portion of the work will consist of classing the firsts of each fleece brought to him into the qualities I have mentioned, or any other that he thinks necessary to make. The instructions to the shed hands, telling them how to distinguish the different qualities, will be unnecessary if he is putting his fine and coarse seconds together. If, on the other hand, he is making two lines of these sorts, it will be necessary for them to know the qualities he desires each sort kept at. The classer should go around and look at the seconds and thirds occasionally, to see that the sorters are not letting any good wool go into these lines.

CLASSING FARMERS' AND GRAZIERS' LOTS.

Owing to the large number of big estates that are being cut up, there is a greatly increased number of small lots of wool, grown by farmers and small graziers, being sent to Melbourne, Sydney, and other selling centres.

If farmers wish to get good prices for their wool they must be careful how they prepare it for the market. I have frequently seen lots of eight or nine bales containing fleece wool, locks, stains and dags—in fact, everything shorn from the sheep, just picked up off the shearing board and thrown in the bale together. Some farmers keep the locks separate, but roll the bellies and

stains up in the centre of the fleece. A good many farmers say that it does not pay to go to the trouble of classing and skirting their wool, as they get 3d. or 4d. per lb. less for the wool they take off and no more for the fleece. This is not so, as skirted wool will bring from 1d. to 3d. per lb. more than the unskirted fleeces, according to the quantity of dirty or burry wool which is taken off. I sent ten bales of Merino wool to the Melbourne sales shorn off the sheep in one paddock. Five of the bales I had skirted, the other five were sold just as they were taken off the board, except that all the locks were kept out, and the stained britch taken off the fleece. I received just 1½d. per lb. more for my skirted lot. Both lots were sold on the same day and they were very even in condition and quality, as each alternative fleece was skirted. Some farmers place the same value on their wool every year. This is often the cause of trouble between themselves and the selling brokers, as it is no unusual thing for wool values to fluctuate from 10 per cent. to 30 per cent. in a season.

In commencing to shear his sheep, the first thing the farmer should do is to thoroughly clean out the shed or barn in which he intends to have his sheep shorn, to avoid any foreign matter such as straw, chaff, or twine being mixed with the wool. The next thing to get ready is the wool table, which should have half an inch or so between each batten of 1 inch or 1½ inches wide. This space allows the locks or second cuts to fall from the fleece through the table on to the floor. A very good wool table can be made out of small round branches about the size of an ordinary broom-handle. The table should have four boards nailed at the bottom to prevent the locks from becoming scattered over the floor. Another thing is the sheep-yard, which should be covered with grass; this can easily be done by letting no sheep into it for three or four weeks before shearing. If it has become very dry and dusty, it should be sprinkled with water so that the dust will be kept down, because nothing is more injurious to the appearance of the wool than dust.

Very often the farmer has two types of sheep, such as Merino and Cross-bred. He should draft the Merino from the Cross-bred and shear each lot separately. The fleece should be picked up by

the britch and drawn in folds towards you and then thrown on the rolling table, the clean or cut side underneath. The fleece should be skirted lightly all round, just taking off the heaviest of the burr, if any, and all the dark fribby edges. The stained britch wool should be kept separate from the other skirts or pieces. The fleece should then be rolled in the manner that I have described in the chapter dealing generally with Wool-classing. Some farmers tie the fleeces with string and binding twine. This should not be done, as hemp in the wool is very objectionable to manufacturers. Not much classing is necessary for these small lots. If the farmer's flock is all Merino, he can make two sorts, one consisting of all the nice long-stapled, bright, light-conditioned fleeces, the other containing all the dull and shabbier fleeces. Rams' fleeces should be kept out of these sorts. They could be put in a bag and sold separately. Where the flock is all Cross-bred the same number of sorts will suffice, one consisting of all the fine Cross-bred fleeces, and the other of all the coarse fleeces. Lincoln rams' fleeces should be kept out of the above sorts. If the farmer comes across any very dull, heavy, dirty fleeces that are much below the average, he can put them in a bag or break them up and blend them with the pieces or skirts.

A farmer with a Merino flock could brand his wool as follows :—

A.A. Merino.—Consisting of all the good, bright, light Merino fleeces.

A. Merino.—Consisting of all the heavy-conditioned and dull fleeces.

For Cross-bred wool he could use the following brands :—

A.A. Cross-bred.—Consisting of all the fine, light, Cross-bred fleeces.

A. Cross-bred.—Consisting of all the coarse Cross-bred fleeces.

Lincoln or Leicester.—Consisting of any pure-bred English long-wool fleeces.

All the belly wool should be kept by itself. The fleece wool should be baled up neatly and carefully, not making the bale too heavy. The bales should be branded plainly, stating the contents, and the owner's brand or name of the farm. The locks and stained pieces could be baled up together with a sheet of paper separating

the two sorts. The bale should then be marked stating the two sorts it contains. Bellies should be branded "Bellies," and should have the stains taken out of the centre of the wether bellies.

If the farmer is shearing lambs, all that is necessary for him to do is to keep the Merino separate from the Cross-bred and remove any stains and dags out of the fleeces.

Odd lots put up in bags generally bring their full market value, as competition for bag wools is very keen at the present time, and the bags are interlotted by the wool-brokers so as to make them into very large lines.

CLASSING LARGE FARMERS' CLIPS.

There are a great number of small graziers who have not enough sheep to enable them to profitably employ a classer at shearing time, yet have considerably more sheep than the average farmer. I am referring to the man with 2,000 or 3,000 sheep. He cannot make as many lines of his fleece wool as the station owner who has a flock of 10,000 sheep or more. Most small graziers spend a lot of time with their sheep, and they can attend to the wants of the sheep better than the owner of the larger flocks. A small grazier should try to get his flock as even as possible, as it will save trouble at shearing time, and his wool will be in large and even lines, thus commanding keen competition, which may make fully 1d. per lb. difference in his wool, which means 7d. or 8d. per sheep, and this is a big consideration when 2,000 or 3,000 sheep are shorn.

We will take a Merino flock of 2,000 or 3,000 sheep. I think the following sorts of wool will be found suitable :—

A.A. Merino.—Consisting of all the very bright, light-conditioned long-stapled fleeces.

A. Merino.—Consisting of all the shorter and duller fleeces, keeping out all rams' fleeces and any very yellow or extra heavy-conditioned fleeces.

A. Fleece.—Consisting of all the tender or unsound Merino fleeces, keeping out any discoloured or very heavy-conditioned fleeces.

Fleece.—A cast sort consisting of all the very heavy-conditioned, tender, and other Merino fleeces.

Rams' wool should be kept out of the above sorts and baled up

separately. The pieces should be treated in the same manner as I shall describe under the heading of "Pieces, Locks, Bellies, etc."

We will next take the average grazier's flock of Cross-bred sheep. I think the following lines of fleece wool will be found suitable.

A.A. Comeback.—Consisting of all the fine, Cross-bred fleeces, light-conditioned and long-stapled.

A. Comeback.—Consisting of all the heavy-conditioned and dull shorter-stapled fleeces of the same quality as the A.A. Comeback. Any fine, tender fleeces could be put in this line.

A.A. Cross-bred.—Consisting of all the medium quality Cross-bred fleeces, keeping out any very heavy-conditioned or short-stapled fleeces.

A. Cross-bred.—Consisting of all the coarse Cross-bred fleeces, keeping out any very shabby and cotted fleeces.

Cross-bred Fleece.—Consisting of all the very heavy, cotted medium, and coarse quality Cross-bred fleece.

Lincoln.—Consisting of all pure-bred long wools.

The wool having been classed into the above lines, the brokers will have no difficulty in lotting the wool, and each lot will bring its full market value, which mixed lots will not do. All pure-bred wools, such as Lincoln, Cotswold, and others, should not be put into the A. Cross-bred line, but put up separately and branded "Lincoln" or whatever breed they are. The pieces should be treated as described in chapter entitled "Pieces, Locks, Bellies, etc."

In branding the wool be sure to put the sex mark on the bales. If you were shearing wethers you would put W under the brand. For ewes you would put E. Two-tooths are generally branded with an H, meaning hoggets.

CLASSING PURE-BRED LONG WOOLS.

Lincoln, Leicester, Cotswold, etc.

The long wools, such as grown by the Lincoln, Leicester, and other British sheep, are much easier to class than the average mixed Cross-bred or Merino flock, and the distinction between the sorts or classes is more apparent. In making classes of fleece wool the main thing is to get the lines as even as possible without

making them too small. The following sorts of fleece wool will be found suitable for the flocks I have mentioned :—

A.A. Lincoln or Leicester.—Consisting of all the bright, long, free, and sound-stapled fleeces of 40's quality.

A. Lincoln.—Similar wool to A.A. only heavier in condition, also a little coarser, quality 40's to 36's.

Lincoln Fleece.—Consisting of cotted and hairy fleeces of 40's and 36's quality.

If the sheep have been on good grass country up till shearing time, and the wool is very clean and light in condition, the classer could make a super line in addition to those I have named, consisting of all the very long, and finest free-stapled, bright, light-conditioned fleeces.

CLASSING BLACK WOOL.

Black wool is usually bundled together in a bale on the sheep stations. As there is seldom more than a bale or two, it is the only thing the classer can do with it, though he should keep black lambs' wool apart from the black fleece or pieces.

In big establishments where they have considerable quantities of black wool, it is classed out into its various qualities like the white wools, though it is classed on colour as well. A classer would class it into jets, as the jet-black fleeces are called ; also brownish blacks, greys and mixed, or fleeces containing both black and white wool. Black wool is very often blended in with other wools, and in some cases it is dyed to make it a uniform shade. People of religious sects who do not wear dyed garments have their dark materials made up from black wools in their natural colour.

PIECES, LOCKS, BELLIES, ETC.

All the pieces which have been skirted off the fleeces by the wool-roller are packed up and taken to another table where they are sorted by the piece-pickers. The reason for sorting is to remove all the stained wool from the britch skirts, and to make a line of the best and bulkiest pieces, calling them A.A. pieces, the

seconds consisting of the fatty-edged and cotted pieces. In some cases where the skirts are all burry, the firsts or A.A. pieces will consist of the bulkiest and lightest burry wool, the seconds consisting of the heavy burry and yolky pieces. The neck wool is often kept apart from the other skirts, but it is only advisable to keep it separate on large Merino stations, where you can get large even lines of neck wool.

I do not think it advisable to keep them separate on a small place. The following lines of pieces will be found suitable for average clips :—

A.A. Pieces.—Consisting of all the bulkiest and best of the skirts free from burr, if possible.

A. Pieces.—Consisting of all the short and burry pieces with fatty ends, also any burry or cotted neck wool. This line should be kept free from urine stains.

Stained Pieces.—Consisting of all the stained pieces taken off the britch skirts, and out of the centre of the wether bellies. The stained wool should be dried on sheets in the open before baling.

The above will apply to Cross-bred pieces as well as Merino. If Cross-bred sheep are drafted before shearing the pieces will be in a fairly even line, but if fine, medium, and coarse-woolled Cross-bred sheep are shorn together the classer cannot do much with them, as the average shed hand does not understand qualities, though he might be able to throw any of the very coarse pieces out. These could be made into a line, by themselves.

LOCKS.

Locks should be run over the table and the dags and rubbish, such as broom, whisks, matches, etc., taken out of them. Comb-ing wool—that is, very small pieces—should be picked out and taken to the piece-picker's table, where it can be sorted into first, second, or stained pieces.

Wether bellies should have the stains taken from them. Ewe bellies can be pressed without any sorting at all, as it does not pay to skirt bellies.

RE-CLASSING BY WOOL-BROKERS, DEALERS, ETC.

Re-classing is generally done by wool-dealers and brokers. The latter employ competent classers to re-class any clips that have been badly graded on the stations or farms, or that have been sent to town without any previous classing whatever. Large wool-dealers re-class their wools so that they can make them into large even lines resembling station clips, and very often they use a station brand, and the wool is so evenly classed that it is difficult to tell it from a station clip.

We will take re-classing as it is usually done by the wool-brokers. They seldom have to re-class any very large clips, because the stations generally employ competent classers at shearing time. The bulk of the re-classing done in the stores consists of lots of ten to fifty bales, as very often sheep farmers send their wool down with all qualities and types mixed in the bales together, and the fleeces are very often unskirted. The wool-classer has the bales opened up and examines them thoroughly, and decides whether they are to be skirted or not. He will then class them out, making even lines of the wool so that each lot will command competition and bring its full value. Say, for instance, he has to class out a farmer's ten-bale lot of mixed Cross-bred wool with Comeback and Lincoln fleeces, and all the qualities between, packed together. The classer would then make about three separate lines of wool out of the ten bales of mixed fleece, consisting of fine, medium, and coarse Cross-bred. He would brand them as follows :—

A.A. Cross-bred.—Consisting of all the fine fleeces of 56's to 58's quality.

A. Cross-bred.—Consisting of all the medium fleeces of 46's to 50's quality.

B. Cross-bred.—Consisting of the coarse fleeces of 36's and 40's quality.

The wool would then be in fairly even lines. If you made more classes than I have named your lots would be too small, though if the broker was interlotting the wool you could class it right out. Interlotting is putting wools of the same quality and money value together, and selling them in one big line,



"LIEWAH" STATION HOMESTEAD, NEW SOUTH WALES.

though the wool may belong to several different clients. By interlotting the man with only one or two bales of wool will get as much competition as the men with larger lots. A ten-bale lot of wool is not large enough to allow it to be classed on condition, but if that lot contains any very heavy-conditioned or discoloured fleeces that are considerably lower than the average, they should be kept apart from the other wool. These very heavy, odd fleeces could be broken up and sold with the pieces. If the classer has a lot of, say, forty or fifty bales of mixed Cross-bred wools to re-class he will find the following lines of wool suitable :—

- A.A. Comeback.**—Consisting of all the lightest-conditioned, long, sound-stapled fleeces of 58's and 56's quality.
- A.A. Cross-bred.**—Consisting of all the light-conditioned, long, sound-stapled fleeces of 50's quality.
- A. Cross-bred.**—Consisting of all the light-conditioned, long, sound-stapled fleeces of 46's quality.
- A.A. Lincoln.**—Consisting of all the bright, long, free, sound-stapled fleeces of 40's quality.
- A. Comeback.**—Consisting of all the heavier-conditioned and shorter-stapled fleeces of 58's and 56's quality.
- B. Cross-bred.**—Consisting of all the heavier-conditioned and shorter-stapled fleeces of 50's quality.
- Cross-bred B.**—Consisting of all the heavier-conditioned and short-stapled fleeces of 46's quality.
- A. Lincoln.**—Consisting of all the heavy-conditioned and hairy fleeces of 40's and 36's quality, also cotted fleeces.

If a line of very fine Comeback is required, the A.A. Comeback could be confined to 58's quality, and another line of wool made of the 56's which could be branded "A. Quarter-bred." Large dealers buy as much as 500 to 1,000 bales from the farmers. In this case, it would pay the dealer to employ a skilled classer, and have the work done properly.

In re-classing large lines or lots of 500 to 1,000 bales it is advisable to make every count or quality of Cross-bred wool. The tender wool should also be kept separate. Sometimes the dealer will buy wool of a different colour to the bulk of his purchase, such as charcoaly and red wools, etc. These wools

must not be classed in with the white wools but classed out by themselves, and lines made according to the quantity obtained. Country dealers generally confine themselves to one district, and the bulk of their purchases will match fairly well as regards colour. In most cases it is advisable to have the whole of the fleece wool skirted, as a great many farmers are not too particular as to the way the wool is got up, bellies, locks, etc., very often being rolled up in the centre of the fleece. The wool-roller or sorter opens up each fleece, and takes off all the faulty wool as instructed by the classer. The skirts should then be taken to a piece-picker, or better still to a wool-sorter, who will grade them out into their various lines and qualities, so that they can be placed on the market in a proper and profitable manner. I advise the following classes to be made out of a line of mixed Cross-bred and Merino wools.

Super-Merino.—Consisting of all the best clean-tipped wool, possessing a long, sound staple, very light in condition, and bright, the best Merino wool obtainable from the lot being re-classed. This line is not necessary unless the dealer has purchased some very high-class wools.

A.A. Merino.—Consisting of all the Merino fleeces, light-conditioned, sound-stapled, only a little shorter than the super Merino.

A. Merino.—Consisting of all the short and heavier-conditioned Merino fleeces.

B. Merino.—Consisting of all the light-conditioned tender fleeces.

Merino Fleece.—A cast lot containing all the very heavy and discoloured fleeces, also any very heavy-conditioned, tender wools.

A.A. Comeback.—Consisting of all the bright, long, sound-stapled, light-conditioned fleeces of 58's quality.

A. Comeback.—Consisting of all the heavier-conditioned, sound, dull fleeces, of 58's quality.

A.A. $\frac{1}{4}$ -Bred.—Consisting of all the bright, long, sound-stapled, light-conditioned fleeces of 56's quality.

A. $\frac{1}{4}$ -Bred.—Consisting of all the heavier-conditioned, sound fleeces of 56's quality.

A.A. $\frac{1}{2}$ -Bred.—Consisting of all the longest, sound-stapled, light-conditioned fleeces of 50's quality.

A. $\frac{1}{2}$ -Bred.—Consisting of all the heavier and duller sound fleeces of 50's quality.

A.A. $\frac{3}{4}$ -Bred.—Consisting of all the long, sound-stapled fleeces of 46's quality, bright and light in condition.

A. $\frac{3}{4}$ -Bred.—Consisting of all the heavier and duller sound fleeces of 46's quality.

A.A. Lincoln.—Consisting of all the bright, long, free, sound-stapled, light-conditioned Lincoln or Leicester fleeces of 40's quality.

A. Lincoln.—Similar wool to A.A., only heavier, coarser, and duller fleeces.

A.A.A. Fleece.—Consisting of all the tender fleeces, fairly light in condition, of 56's and 58's quality.

A.A. Fleece.—Consisting of all the tender fleeces of 50's quality, keeping any very heavy-conditioned or low, tender fleeces out of this line.

A. Fleece.—Consisting of all the unsound or tender fleeces of 46's quality, keeping any very heavy-conditioned fleeces out.

Fleece.—Consisting of all the cotted $\frac{3}{4}$ -bred (46's quality) and Lincoln fleeces.

I think the above sorts of wool will be found suitable for the large lines of wool that are often obtained by dealers in town and country. In the three lines of fleece, the A.A.A., A.A., and A., I have advised keeping out any very heavy-conditioned, tender fleeces. These could be baled up separately, or if there were any quantity of them they could be classed into two or three sorts, such as fine and coarse Cross-bred, a medium line being added if necessary. In regard to the low sorts, such as pieces and bellies, all information as to how they are got up will be found in the chapter on "Wool-sorting."

MIXED FLOCKS.

One thing I would like to impress upon the young classer is, that in starting to make lines of fleece wool he must use his own judgment a good deal, as he will sometimes come across a shed with a very mixed flock, such as one where they shear large lines of dealers' sheep, or where the country on the station varies and each portion produces a different type of wool. It would not be practicable nor could any one advise without seeing the wool what lines it would be advisable to make out of these mixed flocks. Particular care should be taken and the number of the bales that finish each separate lot noted, so that they can be given to the selling broker, or, better still, some alteration of the brand could be made. For instance, if you brand the top line of wool off clear grass country A.A. Comb, and you get the same line off another flock of sheep which have been grazing on burnt or scrub country, and the wool is discoloured by charcoal, it would be better to call it First Comb, to make a

distinction between it and the same line off the grass country. The classer should always remember to change the sex or age mark on the bales when a start is made on another flock, *e.g.*, First Comb Ewes should be altered to First Comb Wethers when the latter are getting shorn.

Some Queensland wool has a stain through it called Canary stain, which will not scour out. It is of a pale yellow colour. Wools with this stain should be kept in a sort by themselves.



[Photo by Author.]

PRESSING THE WOOL.

Steel skewers holding cap to side of bale.

CHAPTER XIII

PRESSING THE CLIP

Correct method of fastening and branding bales.

THE pressing of the wool plays a very important part in the get-up of a clip, and in some cases it is not done as it should be, to the great detriment of the appearance of the wool. Buyers have made many complaints about the large quantity of twine and hemp fibres which the wool contains. This hemp does not take the dye like wool, and shows up on the face of the cloth. Hemp in wool is mostly caused by the growers using cheap and loosely woven packs, and not by pieces of string or twine, as the latter can easily be picked out by the sorters. The hairy surface off a cheap bale lets the small, hempy fibres into the wool, and it is impossible to pick them out by hand.

During the last two or three years a new method of fastening the bales has become very popular amongst the growers, and it is welcomed by the buyers. I consider it very much superior to the old method of sewing the bales all round. The wool is pressed in the usual way. When the monkey of the press is down, instead of sewing the cap to the sides of the bale it is fastened to the side by four steel skewers, two on each side (see illustration). The monkey of the press is then raised, the skewers holding the cap to the sides of the bale securely. The two sides of the bale where the pins are, are thrown over the cap and fastened by three stitches (see illustration). The two opposite sides of the bale are next thrown over in the same manner as the first two, and two pins inserted to keep them



[Photo by Author.]

PRESSING THE WOOL.

Monkey of press raised, and sides of bale thrown over cap and held together by three stitches.



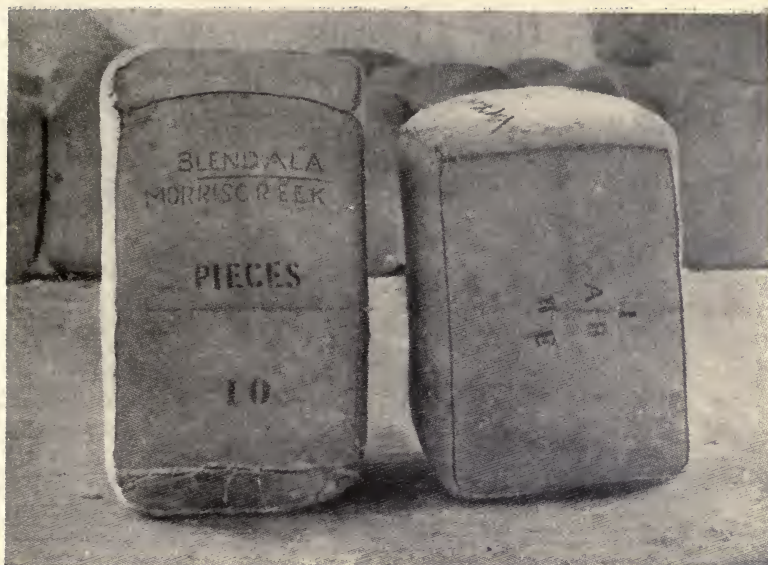
PRESSING THE WOOL.

[Photo by Author.]

Remaining two sides of bale thrown over and fastened with three stitches.
The pins are now withdrawn and the bale is finished.

in position. The two sides of the bale are then fastened by a few stitches on each side where the two small pins are. The needle is put through the side of the bale and through the two flaps three or four times, where they overlap. Sometimes a stitch is put in the centre also. The skewers are then pulled out and the pressing and fastening of the bale is completed (see illustration.) Bales fastened in this manner hold splendidly.

In placing fleeces in the bale they should be put in layers, not bundled in anyhow. For fleece wool the weight in a bale should be about 300 or 320 lb. Locks and stained pieces can be made considerably heavier. A large number of small growers do not brand their wool properly, some just placing two or three small letters on the bales, also a description of the wool it contains. Bales branded in this manner are very liable to go astray, or be mistaken for another client's wool. The best way to brand the bales is to put the owner's initials on the top of the bale, and immediately underneath them the name of the farm or station. The description of the wool in the bale, such as First or Second Combing, etc., should follow, then the sex or age of the sheep, as E. for ewes, W.H. for wether hoggets, and then the number of the bale. The bales should be branded on one end with the name of the farm or station, and underneath that the number, so that they can be seen in a stack without having to pull it to pieces. (See illustrations.)



[Photo by kind permission of "Dalgety's Review."

ILLUSTRATIONS OF BALES BRANDED WITH SMALL LETTERS, WHICH ARE NOT RECOMMENDED.



[Photo by kind permission of "Dalgety's Review."

EXAMPLES OF EFFECTIVE BRANDING OF WOOL BALES.

CHAPTER XIV

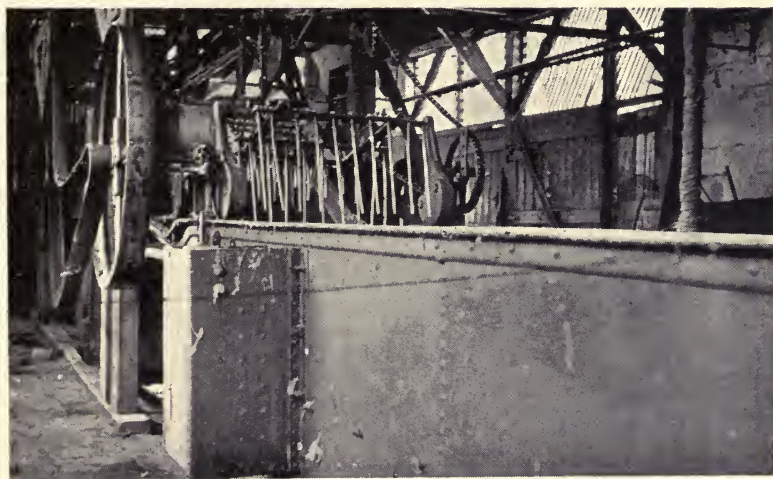
WOOL-SCOURING

Methods of wool-scouring—Drying the wool—Scouring small samples to ascertain yield of wool.

WOOL-SCOURING is the first mechanical process which greasy wool undergoes. Wool-scouring, or washing, as it is sometimes called, removes all the grease or yolk and earthy matters which all greasy wools contain.

There are several methods of scouring, such as pot-sticking, Williams's Boxes, and by machine. Wool can be well scoured by any of these methods, but the machine turns out the most attractive work. All manufacturers and scourers who have large quantities of wool to scour use the machine, as it is by far the fastest method of scouring. There are several different makes of scouring machines in Australia. The two most used are Hall's—an Australian-made machine—and McNaught's, an English machine. McNaught's machine contains four tanks. Most of the yolk and dirt is taken out of the wool in the first tank. This tank does not require a very strong liquor, as the yolk in the wool acts as a soap itself. The temperature of the scouring liquors varies, as some wools require much warmer and stronger liquors to scour them than others; the average temperature is about 115° F. The greasy wool is thrown into the first tank of the scouring machine. It is then gently propelled forward by forks which have a circular motion; these forks gradually get the wool to the end of the tank. It is next caught by two rollers which squeeze most of the liquor and dirt out of it, which runs back into the tank.

Some of the English scouring machines have the rollers right in the tank, the nip being just under the level of the liquor. The advantage of this is that the dirt is squeezed out of the wool, not into it, as is the case when the wool is allowed to lie for a moment or so out of the liquor before going through the rollers, because the sodden fibres cling or bunch together immediately they leave the liquor. In case I am not understood, take a staple of wool and place it in a cup of warm water and note how it spreads—each fibre is separated from the other. Now lift it out of the water



[Photo by Author.]

SHOWING FORKS WHICH PROPEL WOOL SLOWLY FORWARD TO THE ROLLERS
ON END OF SCOURING TANKS.

and the fibres will bunch or hang together immediately. The McNaught machine does not have its rollers under the liquor in the tank, but they are so arranged that there is a wash right up to the rollers, which keeps the fibres separated and open. In these machines the liquor and dirt that the rollers squeeze from the wool does not run back into the tank, but falls into a bowl or small tank right under the bottom roller; from this small tank it goes into the settling tank. Each scouring tank has a small-mesh sieve about 18 inches from the bottom, and all the dirt and small

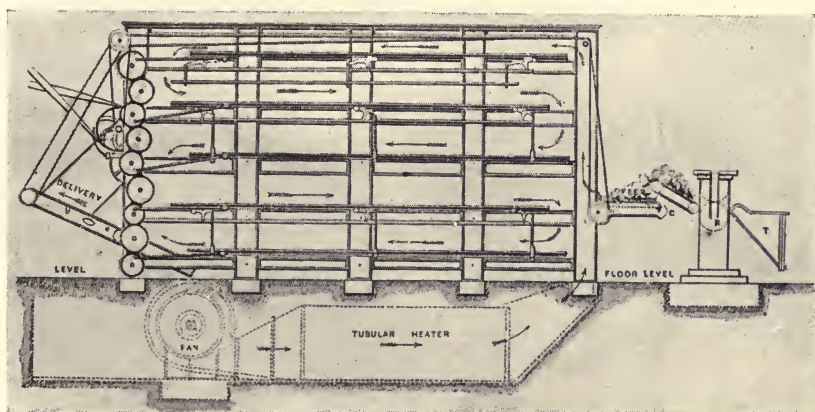


[Photo by Author.]

WOOL-SCOURING MACHINE.

sandy particles fall through this sieve and settle in the bottom of the tank. When scouring very low or sandy wools the liquor in the tanks has to be frequently run off and replaced with fresh, and the dirt removed from under the sieves in the tanks.

After passing through the rollers at the end of the first tank, it falls into the next, and it goes through the same operation till it reaches the last tank, which is filled with water. The wool is well rinsed in this tank to free it from soapy and any other foreign matters it may contain. Of course, scouring does not remove the



[From "Wool Manufacture," by R. Beaumont.]

INTERIOR OF WOOL-DRYING MACHINE.

burr or other vegetable matter from the wool. Most of the water is squeezed from the wool in the rollers at the end of this rinsing tank. After leaving the rollers it falls into a fast-revolving cylinder, which opens the wool up and throws it on the floor at the end of the machine. It is then taken to be dried. This is often done by spreading the wool out on sheets in the open air; in large establishments it is dried by artificial means. The machine used is called a Drier. There are several types of drying machines. Some consist of a floor of fine, strong wire netting. The wool is spread over it in a thin layer and hot air is forced up through it by large fans. These drying-rooms are called



EXTERIOR OF WOOL-DRYING MACHINE.

[Photo by Author.]

“kilns,” and they are used by several firms in Australasia. The wool has to be frequently turned to prevent it from scorching, and to ensure it drying evenly. The best artificial wool-drier I have seen, and one that is used by all the large English and Australasian wool-scourers, has five shelves inside it, one above the other. The wool enters the machine and is forced up to the first shelf by a current of hot air, which is produced by fans working at a high speed. This continuous current of hot air drives the wool along the shelves as indicated by the arrows in the diagram. In this manner it goes right through the machine and comes out perfectly dry. Wool dried in this manner cannot be scorched, as it is constantly on the move. The hot air opens it up and it leaves the machine in a nice, open, and fleecy-looking condition.

SCOURING SMALL SAMPLES.

Many students like to scour small samples of wool and to work out the yields; 10 to 12 oz. of wool is a sufficient quantity to test. The following method will be found to give good results for small samples. First get a small washtub or similar dish, then pare a few thin slices off a piece of soap and dissolve them in hot water in the dish. The average temperature of the water in which wool is scoured is 115° F., though in scouring a sample for testing the main object is the removal of all the dirt and yolk, and the water is generally tested with the hand. The water should be hot enough to allow one to bear the hand in it. In fact, a good many wool-scourers test the heat of their scouring tanks by the hand, and rarely use a thermometer. When the soap has been dissolved the hot water should have a soft or slimy feel; if it has not, more soap should be added till it acquires that feel. Now put the wool you desire to test into this liquor and stir, or, better still, puddle it so that the liquor covers it all. One of the main things is to have plenty of liquor, because the wool will not scour well if it has an insufficient quantity. Leave it in the liquor for five minutes, or longer, keeping it on the move the whole time. The wool should now be taken out

and all the liquor possible squeezed out of it. A small mangle or wringer is very good for this purpose. The wool should be rinsed again in warm water and given a final washing in cold water and put through the wringer again so that all surplus moisture is squeezed out. The wool should then be thoroughly dried in the sun. If the weather is unsuitable for drying the wool can be placed in the oven, but it should be allowed to cool for some hours before weighing, as, if dried in an oven, or by artificial means, it is sure to lose too much of its natural moisture. Normal wools contain 16 per cent. of moisture. The yield can be worked out as follows. Say, for instance, we have scoured 12 oz. of greasy wool and we get 6 oz. of clean, scoured wool. What percentage did the sample yield? It can be worked out by making a proportion sum of it. If 12 oz. is 100 per cent., what percentage is 6 oz.? As 6 oz. is less you put it in the second term—12 oz. : 6 oz. :: 100 per cent. As the percentage is the answer required, 100 per cent. goes into the third term. You multiply the second and third term together, and divide by the first. Therefore $\frac{6 \times 100}{12} = 50$ per cent. The answer is therefore 50 per cent.

Wool when properly scoured should be free from all yolk, dirt, and knots, and should have a "kind" feel. Badly scoured wools are very often gummy, owing to some of the yolk or grease having been left in them. Wool which has been roped in the scouring process—that is, tangled into knotty and rope-like pieces instead of being open and free—declines about 3d. per lb. in value, so it is very unprofitable to employ an unskilled scourer. Roped wool cannot be combed as economically as the free, a large percentage of it going into noils. You very seldom see wool roped when scoured by machine. It occurs very often when the pot-sticking method is used by unskilful operators. As I have mentioned earlier, different wools require different temperatures; to scour stained pieces you would require a hot, strong liquor, while to scour Cross-bred fleece you would not need a liquor nearly as strong.

CHAPTER XV

WOOL-SELLING

Wool-selling charges—Date of sales in Australia—Conditions of sale.

THE bulk of the Australian wool clip is now sold in Australia, the sales attracting buyers from almost every country in the world, the competition being if anything keener than that in London, as speculating shippers sometimes find out to their cost.

The wool is offered in large well-lighted stores, and is on view from six o'clock in the morning, at which hour buyers can be seen making a start, the light being quite good.

Two brokers' catalogues are offered daily, with a few exceptions, the combined offerings being limited to 12,000 bales per day. Buyers therefore need to start early if they wish to view all the wool offered, as the sale starts punctually at three o'clock in the afternoon of the same day the wool is shown.

Luncheon is provided for the buyers by the wool-selling brokers at the stores, which saves buyers going out and therefore losing valuable time.)

The auctioneer at a wool sale very seldom has to ask for a bid. Usually as soon as he mentions the catalogue number of the lot being offered, the buyers fairly shriek and yell at him the price they are willing to pay, every one in the not unmusical choir trying to yell his bid louder than the other.

The lots are knocked down and sold quicker than the average person can write down the price bid. The sale being over, the wool-brokers have the invoices for £100,000 to £120,000 worth



WOOL OPENED UP FOR BUYERS' INSPECTION AT WAREHOUSE, KENSINGTON, MELBOURNE.

of wool in the hands of the different buyers the same evening or first thing the following morning.

The speed with which everything connected with wool-selling in Australia is effected is truly wonderful ; it speaks well for the system and manner in which the sales are conducted by the selling brokers.

There are very few mistakes or complaints made, and our Law Courts are seldom troubled with wool disputes. The charges for selling wool in Australia have been raised this season, 1913-14, the prices now being as follows :—

Receiving, Weighing, Warehousing, Lotting, Re-						
packing, Sale Expenses, etc.	...	...	...	...	...	One-eighth of 1d. per lb.
Commission	...	...	...	...	...	£200 and under, 3 per cent.
"	...	...	...	...	...	£200 to £500, 2 per cent.
"	...	...	...	...	...	Over £500, 1½ per cent.
Insurance	...	...	...	...	...	1s. 6d. per cent.

Farmers are supplied by the selling brokers with printed weight books and other necessary printed forms, to enable them to dispatch their wool without a great deal of trouble. Most of the stores have a railway siding running alongside, the bales being unloaded from the railway trucks right on to the store platforms, thus avoiding all town cartage expenses.

Most of the brokers have an up-to-date shearing shed on the premises. A sum of sixpence per sheep is charged for shearing ; this includes cost of classing, baling, and branding the wool. At wool-brokers' shearing sheds anything from 40,000 to 70,000 sheep are shorn during the season.

The wool-selling season in Australia opens on or about the following dates :—

Sydney	...	...	...	...	September 9th
Melbourne	...	...	...	...	October 10th
Brisbane	...	...	...	...	September 15th, and after regular selling season, one sale every month
Adelaide	...	...	...	...	September 20th
Geelong	...	...	...	...	October 30th
Hobart	...	...	...	...	} First week in January
Launceston	...	...	...	...
New Zealand	...	...	...	...	Early in November

Below is a list of the conditions under which wool is sold in most of the Australian States.

CONDITIONS OF SALE.

1. The highest bidder shall be the purchaser—the vendor reserves to himself the right of one bid ; and if any dispute arise among the bidders for any lot, it shall be decided by the auctioneer, unless one of the claimants will advance ; in which case the lot shall be put up again, the bidding to be then confined to the disputing parties.

2. The goods shall be weighed by the warehouse-keeper and taken away within fourteen days from the date of sale at the buyer's expense, and shall be paid for in cash before removal. During the said fourteen days (unless removed previously, or during such time as the goods shall remain unpaid for in the custody of the brokers, notwithstanding that the said fourteen days shall have expired), such goods shall be held covered by the brokers against loss or damage by fire to an amount not exceeding the invoice value thereof, and subject to the terms, conditions, and settlement of the policies of insurance effected by the brokers.

3. During six days from the time of sale every reasonable facility will be given by the warehouse-keeper for the examination of any portion of the bulk not previously seen, and should it appear to the purchaser that any bale or bales materially differ from those exhibited at the time of sale, any dispute or claim made by the purchaser in respect of such difference shall (if not forthwith arranged) be referred to the decision of two impartial persons—one to be chosen by the selling broker, the other by the purchaser—who shall, if they disagree, nominate an umpire, and the award of such arbitrators or umpire shall be conclusive on the parties, provided the same be made in writing within the said six days. And neither party shall be at liberty to institute proceedings at law or in equity against the other during the said six days, or until such dispute shall have been submitted to arbitration, as aforesaid, and the arbitrators or umpire shall have neglected or delayed to give their or his award to the disputants during the said six days ; and, if the decision of such arbitrators or umpire be in favour of the purchaser, then he shall be at liberty to cancel the sale by giving notice in writing of his intention to do so to the broker, during business hours, before the expiration of the said six days, and on such cancellation, the vendor shall be under no further liability in respect of the said sale. The cost of the arbitration and award to abide the event ; and if through any neglect or omission on the part of the buyer the matter in dispute shall not be submitted to arbitration as aforesaid, the sale shall be held good and valid, and the purchaser shall be bound to accept the property sold. And this condition shall not prejudice the vendor's right under the other conditions herein contained.

4. All goods shall be at the risk of the purchaser at the expiration of six days from date of sale (save the fire risk on goods not paid for, as provided in Clause 2 hereof), after which no allowance will be made for faults, errors of description, difference of weights, or other claim of whatever nature or

kind, except in case of false packing, any claim for which, if certified by two well-known wool-brokers or merchants, will be recognized and taken into consideration. In the event of any false packing or fraud being discovered, the purchaser shall have the right, during the six days allowed for inspection, to demand and receive from the broker the name of his immediate principal, and these conditions shall form no bar to the prosecution of any claim against the person guilty of such false packing or fraud as the purchaser might or would have at law or in equity or otherwise but for these conditions. But the liability of the broker under these conditions shall in all cases cease, save as above mentioned, at the expiration of the said six days or on the removal of the goods, whichever shall first happen.

5. No person shall advance at any bidding less than $\frac{1}{4}$ d. per lb.

6. The buyer shall pay the broker on wool $\frac{1}{4}$ th of a penny per lb. for warehousing and delivery, with the following exceptions :—(a) Wool realizing $3\frac{1}{2}$ d. or under per lb., $1/6$ per bale ; (b) Fadges, 1/- each ; Sacks 4d. each. A further charge of $\frac{1}{4}$ d. per lb. if repacked, and for new woolpacks (if required) at current rates.

7. The buyer shall (if required), at any time during or after the sale, deposit with the broker £25 per cent. of the broker's estimated value of his purchase, and sign these conditions of sale.

8. If any lot or lots remain unpaid for after the expiration of fourteen days, the before-mentioned deposit (if any) shall be absolutely forfeited, and the buyer shall be liable for any deficiency in price, and for all loss, including interest, survey fees, insurance, and other charges that may accrue on the re-sale thereof, which re-sale the broker shall be at liberty to effect, either by public auction or private contract, with or without notice to the buyer thereof.

CHAPTER XVI

WOOL-BUYING

How wool is valued—English and Continental methods.

THE price of any given wool depends on the percentage of clean scoured wool it contains. Most pastoralists know that raw wool contains a large quantity of greasy yolk, and in addition a considerable quantity of earthy and vegetable matters of no use to the manufacturer. Next in importance to the yield of the wool is the quality, or, in plainer words, the diameter of the wool fibres.

Some wools, such as Lincoln, Cotswold, and that from other breeds of British long-woolled sheep are very coarse, while the Merino wools of this country are noted for their fineness. The value of clean scoured Merino wool is just about double that of clean scoured Lincoln or Cotswold wool.

Following the yield and quality, the length of the staple or fibres is next in importance, also their strength, as some wools are tender, the fibres breaking when subject to any strain. Burrs, seeds, and other vegetable matter also lower the price of the wool, but buyers always reckon this loss when estimating the yield, plus extra cost of removing them.

English buyers buy combing wool on the percentage or yield of top and noil. Tops are partially manufactured wool, the raw wool being scoured and combed, the combing resulting in top and noil, the former consisting of all the long and sound fibres, which are spun into worsted yarns. The noils, consisting of all the very short and broken fibres, are spun into woollen yarns, which are woven into such goods as blankets, flannels, etc.

Shabby, thin-stapled, and tender wools give a much larger percentage of noil than good, long-stapled sound wools, and as Merino noils are usually worth 10 pence per lb. less than the top, this naturally affects the price of the raw wool considerably.

Every buyer has a list of standard qualities by which he classifies the diameters, or quality, of all the fibres of the wools offered for sale in the market he is operating in. English buyers buy on Bradford qualities, which vary from 100's, an exceedingly fine Merino wool, to 28's, a very coarse hairy wool. Particulars of these qualities can be found in the chapter on "Wool-sorting."

The buyer, when examining the greasy or raw wool, puts it down at, for example, say, 64's quality; this would be the quality of a good Australian Merino wool. The 64's top is worth, say, $26\frac{1}{4}$ pence per lb., and noil of the same quality say 16 pence per lb. The first thing the buyer does is to deduct the cost of combing from the value of the top, combing charges for this quality being $2\frac{1}{4}$ pence per lb.; for example—

$$\begin{array}{rcl}
 26\frac{1}{4} \text{ pence per lb.} & = & \text{Value of 64's tops} \\
 \text{less } 2\frac{1}{4} \text{ " " " } & = & \text{Combing charges} \\
 \hline
 24 \text{ " " " } & = & \text{Value of scoured wool containing both top} \\
 & & \text{and noil}
 \end{array}$$

The buyer estimates the wool to tear 9 to 1, which means that for every 9 lb. of top returned there will be 1 lb. of noil, or 1/10th noil.

Therefore—

$$\begin{array}{l}
 \text{Value of scoured wool : 9 lb. of top in every 10 lb. of scoured product} \\
 \frac{24 \times 9}{10} = 21.6 \text{ pence per lb.,}
 \end{array}$$

this being the value of the tops only, contained in scoured product, to which must be added the value of the noil, which we estimated to be 1 to 9, or 1/10th, valued at 16 pence per lb.

Therefore 1/10th noil at 16 pence per lb. = 1.6 pence per lb., being the value of the noils in scoured product.

Therefore—

Tops = $9/10$ ths = 21·6 pence = Value of tops in 1 lb. of scoured product

Noils = $1/10$ th = 1·6 „ = „ noils „ „ „

$10/10$ ths = 23·2 pence,

representing the true value of the scoured product. The buyer estimates what the greasy or raw wool will yield, which, for example, we will put down at 50 per cent.



BUYERS AT WOOL SALE, "RIALTO," MELBOURNE.

Therefore—

True value of scoured wool. Estimated yield of clean scoured
 $23\cdot2$ pence \times 50 per cent. = 11·6 pence,
 100 per cent.

this being the value of the greasy wool.

Buyers in Australia have to deduct from this price the cost of freight, buying commission, insurance, broker's delivery, etc.,

which at the present time amounts to $1\frac{1}{2}$ pence per lb. on the greasy weight of the wool—

$$\begin{array}{rcl} 11.6 \text{ pence per lb.} & = & \text{Value of wool in London} \\ \text{less } 1.5 \text{ " " " } & = & \text{Cost of shipping expenses, etc.} \\ \hline 10.1 \text{ pence,} & & \end{array}$$

being price of wool the buyer is able to bid in the Australian broker's warehouses.



BUYERS AT WOOL SALE, "RIALTO," MELBOURNE.

The following method is employed to find the cost in top form of any greasy wool. For example, we will take the price of the greasy wool at 11.6 pence per lb., which will prove that our last calculation is correct.

The yield is 50 per cent., tearing 9 to 1. Value of noil as before is 16 pence per lb., combing charges $2\frac{1}{4}$ pence per lb. on weight of top.

First find cost of 100 lb. of greasy wool at 11.6 pence per lb.

= 1160 pence. The wool will yield 50 per cent., and there are 9 lb. of top to every 1 lb. of noil, therefore—

$$\begin{array}{l} \text{9/10ths } \left. \begin{array}{l} \text{Lb. of top.} \\ \text{top} \end{array} \right\} \quad \frac{9 \times \frac{50 \text{ per cent.}}{10}}{10} = 45 \text{ lb. of top, being return from} \\ \hspace{15em} 100 \text{ lb. of greasy wool} \end{array}$$

$$\begin{array}{l} \text{1/10th } \left. \begin{array}{l} \text{1/10th noil.} \\ \text{noil} \end{array} \right\} \quad \frac{1 \times \frac{50 \text{ per cent.}}{10}}{10} = 5 \text{ lb. of noil, value 16 pence} \\ \hspace{15em} \text{per lb. = 80 pence} \end{array}$$

The cost of combing the 45 lb. of top at $2\frac{1}{4}$ pence per lb. is 101·25 pence. The money we get for the 5 lb. of noil underpays the combing charges 21·25 pence—

$$\begin{array}{rcl} 101\cdot25 \text{ pence} & = & \text{Combing charges} \\ 80\cdot00 \text{ „} & = & \text{Value of 5 lb. of noil} \\ \hline 21\cdot25 \text{ pence;} & & \end{array}$$

therefore this amount has to be added to the cost of the greasy wool. Sometimes when combing tender and shabby wools, the percentage of noil is high, and overpays the combing charges; in this case the amount in excess of combing charges would be subtracted from the cost of the greasy wool.

$$\begin{array}{r} \text{Cost of greasy wool, 1160 pence} \\ + 21\cdot25 \text{ pence, balance of combing charges} \\ \hline 1181\cdot25 \text{ pence} = \text{cost of 45 lb. of top;} \end{array}$$

therefore—

$$\begin{array}{r} 45 \overline{)1181\cdot25(26\cdot25} \\ \underline{90} \\ 281 \\ \underline{270} \\ 112 \\ \underline{90} \\ 225 \\ \underline{225} \\ \dots \\ = 26\frac{1}{4} \text{ pence, cost of top per lb.} \end{array}$$

The following table will give an idea of how the various Australian wools will tear—*i.e.*, the quantity of top to noil.

	Shabby.	Average.	Good.
Australian Merino wool	4 to 1	7 to 1	9 to 1
Comeback and fine Cross-bred	7 to 1	9 to 1	11 to 1
Medium Cross-bred wool	9 to 1	10 to 1	11 to 1
Lincoln and coarse Cross-bred wools ...	10 to 1	12 to 1	15 to 1

American and Continental manufacturers buy their wool on a clean scoured yield ; they have their limits set for certain types of wool, and simply estimate the clean scoured yields, which with some wools is rather difficult. Bradford yields are 2 per cent. higher than Continental yields on the same wool ; English wool-combers work in 2 per cent. of oil with their tops, while Continental tops are dry combed and contain no oil.

To save time when valuing, buyers have special tables made up which show the prices that can be paid for any wool in the greasy state, allowance being made for combing charges, noils, etc., and in some cases shipping expenses as well. A buyer can then tell the value of any lot of wool he has examined in a few seconds.

Combing charges vary according to the quality of the wool and the percentage of top to noil, payment being made on the returned weight of top only, no charge being made on the weight of noil, The present charges for combing are as follows:—

MERINOS (ALL ABOVE 56's QUALITY).

Tearing—	Pence.	
5 lb. top to 1 lb. of noil and over	2½	per lb.
4 lb. top and under 5 lb. to 1 lb. of noil	2½	„
3 lb. top and under 4 lb. to 1 lb. of noil	2½	„
2 lb. top and under 3 lb. to 1 lb. of noil	3	„
Under 2 lb. of top to 1 lb. of noil	3½	„
Burring	¼	extra
Gilling in	¼	„

Pence,

56's	1 $\frac{7}{8}$ per lb.	
Burring	$\frac{1}{8}$ "	extra
Gilling in	$\frac{1}{4}$ "	"
50's tearing 7 to 1 and over	1 $\frac{3}{8}$ "	"
Tearing under 7 to 1	1 $\frac{7}{8}$ "	"
Burring	$\frac{1}{8}$ "	"
Gilling in	$\frac{1}{4}$ "	"
36's and 46's tearing 8 to 1 and over	1 $\frac{1}{2}$ "	"
36's to 46's tearing under 8 to 1... ..	1 $\frac{5}{8}$ "	"
Burring	$\frac{1}{8}$ "	"
Gilling in	$\frac{1}{4}$ "	"
Wool-scouring—Australian charges, $\frac{3}{4}$ d. to 1d. per lb. of washed wool.		
" English charges, $\frac{3}{4}$ d. per lb. of washed wool.		

CHAPTER XVII

FELLMONGERING

Methods of removing wool from sheep-skins—Sweating and painting methods.

A FELLMONGER is the name given to one who takes the wool off sheep-skins. He also scours the wool and tans or pickles the pelts. Local fellmongers prefer green skins to work because they can be handled more quickly and cheaper than the dry skins, the latter requiring a long soaking in water to soften the pelt. There are two methods in use for loosening the wool on the pelt so that it can be easily pulled out by the hand. One method is called the sweating process, where the wet skins are left in a closed-in chamber till slight decomposition sets in and swells the pelt, thus loosening the wool. The other method of removing the wool is by painting the pelt with a solution of sulphide of sodium, which also swells the pelt and loosens the wool. Both methods are in use to-day by local fellmongers, and I will give a detailed description of them later.

Let us take a skin just as it comes from the abattoirs. The first thing that is done to it is what is called heading and trottering, that is, cutting off all the trotters or feet from the skin, and the head, if it has been left on. The skins are then placed in large vats or pits containing water. This is called soaking. The skins are left in this for one or two hours till the pelt has become very soft. This soaking also removes a great deal of the blood and foreign matter from the wool and pelt. If dry skins are being treated they require about forty-eight hours

in the soaking-pits. The skins are taken out of the pits and allowed to drain. When the bulk of the water has drained from them they are put through a burring machine. This machine removes all the burr from the wool, also sticks and other loose foreign matter. The burring machine contains a pair of rollers which pull the skin in between them. Just behind these rollers is a set of curved blunt blades, similar to those of a lawn-mower.



[Photo by Author.]

BURRING MACHINE FOR REMOVING BURRS AND OTHER VEGETABLE MATTER FROM WOOL ON SHEEP-SKINS.

They revolve amongst the wool or the skin and drag the burr from it. After leaving the burring machine they are again stacked to drain. They cannot be left longer than six hours in summer-time as the stack would heat. In winter they can be left longer.

The skins are now ready for either the painting or the sweating process. We will take the latter process first. The sweat-house resembles a freezing chamber, having thick walls and doors, also

ventilators which can be opened or closed at will. In winter-time the sweat-houses are warmed by steam-pipes. In summer-time this is not necessary. It is advisable on very hot days to reduce the temperature of the chamber by letting cold water run down the walls and over the floors. In summer-time skins require from eighteen to twenty hours in the sweat-house before they will be in a fit state for pulling. A skin is in good pulling condition when the wool on the neck of the skin can be pulled with ease, as this part is the hardest to sweat. After leaving the sweat-house the skins are taken to the pullers, who remove the wool and sort it at the same time.

PAINTING PROCESS.—If the skins are to be painted they are taken, after going through the burring machine, and broken over on beams. This is done to soften the pelt and take all the fatty pieces off it. The skin is next trimmed or pieced, which is the removal of all the straggly ends and legs from the skin, as these extremities cannot be painted very well. The skins are now taken to the painters, who place them in stacks full length on the ground, flesh side up. Ten full wool skins or twenty pelts constitute a stack. The skins are next painted on the flesh side with a solution of sulphide of sodium and lime, painting the neck and the britch a little heavier, as these portions of the pelt are thicker than the other parts. After painting the skins are stacked *flesh to flesh* in heaps of ten or more, so that the paint will not get on the woolly side of the skin. The skins will be ready for pulling in about three hours, but it is better to leave them as long as possible—say, twenty-four hours. The reason for this is that the sulphide of sodium solution loses most of its strength in twenty-four hours and will not burn or hurt the hands of the puller very much. It would be necessary to wear gloves if the skins were pulled soon after painting. Care should be taken when painting so that the paint does not get on the wool, as it discolours it. Wool with paint on it should be washed in cold water immediately it is pulled from the skin. It will then scour fairly white, but if the paint is allowed to dry on it it is impossible to scour it a good colour.

The next process is the removal of the wool from the pelt.



[Photo by Author.]

PULLING SHEEP-SKINS.

The seconds removed from a Merino sheep-skin, similar to skirting a fleece.



[Photo by Author.]

Firsts taken off britch end of skin; the skin is then reversed and the neck end treated similarly to the britch.

This is done in the same way with both painted and sweated skins. The men employed pulling the wool off the skins are called "pullers." The first thing they do on receiving the skins from the sweat-house or the paint stack is to class them into all their different grades or qualities from Merino to Lincoln. The puller usually classes the skins into the following sorts, taking care to keep the length of each class even, as it would not do to place the wool off very short Merino skins with that off long-woolled ones.

MERINO SKINS.—Consisting of all skins with Merino wool.

COMEBACK SKINS.—Consisting of all skins with 58's quality wool.

$\frac{1}{4}$ -BRED SKINS.—Consisting of all skins with 56's quality wool.

$\frac{1}{2}$ -BRED SKINS.—Consisting of all skins with 50's quality wool.

$\frac{3}{4}$ -BRED SKINS.—Consisting of all skins with 46's quality wool.

LINCOLN SKINS.—Consisting of all skins with 36's and 40's quality wool.

Each class or lot of skins is pulled by itself, the puller cleaning up all the wool after pulling each lot of skins so that it will not get mixed with that of another quality. The wool has to be sorted by the puller as he takes it off the skin. He takes all the bulky wool from the centre portions of the fleece for the firsts, the seconds consisting of all shabby wools about the edges of the skin (see diagrams). Very often when sorting the wool on a skin that on the britch end will be a grade coarser than the wool on other parts of it; so on a $\frac{3}{4}$ -bred skin you will often get wool off the britch that will have to be put into the Lincoln quality, and so on. All tar and other brands have to be removed from the skin. The tops of staples which are marked with the brands are cut off. Tar brands are kept separate from raddle brands. The burring machine sometimes fails to remove all the burr, and the puller will have to keep any burry wool separate from the free. The puller has several baskets around him into which he throws the various qualities of wool he gets off each lot of skins. The wool is taken out and dried in the sun; though in most cases it is taken direct to the scouring machine and scoured as it is. All the wool taken from the skins has to be scoured, as the cold-water soakings it has gone through will not remove the yolk from it.

The wool taken off the skins is called slipe wool. The pelt is also treated by the fellmonger. In places where they have no plant for tanning the pelts, they are pickled in a sulphuric acid solution and shipped to their destination.

The pelt when tanned is called a basil. It is used in the manufacture of cheap boots and numerous other articles for which a cheap, light leather is required.

CHAPTER XVIII

SHEEP-SKINS

Preparing for market—Buying—Care of the pelt—Skin-buying in the country.

IN taking the skin off the sheep, care should be taken not to cut the pelt in any way, as this will lessen the value of the skin. One of the worst faults I have noticed in sheep-skins forwarded to town by farmers is that they have not been properly or sufficiently dried. Some sheep-skins have a hard and shrivelled-up pelt, caused by drying in the hot sun, or too long an exposure to the weather, while others have gone green and mouldy in places, through the edges of the skin not being properly stretched out when it has been hung up to dry.

To dry a skin properly the trotters should be cut off and the skin then thrown over a stick or other support running down the centre of the back of the skin from neck to britch, the woolly side being underneath. Sheep-skins should be dried in the shade or under cover, as they are apt to dry too quickly in the sun, which causes the pelt to shrivel and become hard.

Dry skins are sold at so much per lb., therefore it is advisable to take every portion of the skin off. In the skin stores they have artificial means of drying the skins, though a green skin must be dried for a short time by exposure to the air till it gets a slight crust on it, before artificial drying is attempted. The skins are then placed in an oven which is heated by

numbers of steam-pipes both above and below the hanging skins. The temperature of this oven is about 80° F., and it takes about thirty hours to dry a skin so that it can be packed for shipping.

In valuing sheep-skins the condition of the pelt as regards cuts, weevils, dampness, &c., has to be taken into consideration, also the length and quality of the wool. The length of wool on sheep-skins varies a good deal, as sheep are killed all the year round, and you will get pelts from some districts and full-woolled skins from others at the same time. Pelts are skins that have been taken off the sheep a short time after shearing. They therefore have very little wool on them.

The skin-buyers have a list of classes of skins which includes the lengths and qualities of the wool of all sheep-skins offered in the market they are operating in. The town buyers have a list of classes similar to the following :—

MERINO PELTS.—Wool up to $\frac{1}{2}$ in.

MERINO SHORT.—Wool from $\frac{1}{2}$ in. to 1 in.

MERINO CLOTHING.—Wool from 1 in. to $1\frac{1}{2}$ in.

MERINO A. COMBING.—Wool from $1\frac{1}{2}$ in. to 2 in.

MERINO B. COMBING.—Wool from 2 in. to $2\frac{1}{2}$ in.

MERINO C. COMBING.—Wool over $2\frac{1}{2}$ in.

In Cross-bred skins the lengths are slightly different, as the wool on these skins grows faster and longer than Merino wool.

CROSS-BRED PELTS.—All skins with wool up to 1 in. in length.

CROSS-BRED SHORT.—All skins with wool from 1 in. to 2 in. in length.

CROSS-BRED A. COMBING.—All skins with wool from 2 in. to 3 in. in length.

CROSS-BRED B. COMBING.—All skins with wool from 3 in. in length and over.

Most shippers buy the skins on the length and quality of the wool, also state of the pelt; they do not trouble to estimate the yield of the wool on each lot of skins, though buying the skins on the yield of wool is no doubt the best and safest, provided you are competent to estimate the yield correctly.

The list buyers use when valuing sheep-skins would be somewhat like the following:—

Quality or Type.	Super.	Average.	Heavy- con- ditioned.	Heavy Burry.	Dead and Slightly Damaged.	Inferior Dead and Damaged.
Merino Pelts	—	5	4 $\frac{3}{4}$	—	4 $\frac{1}{4}$	3 $\frac{1}{2}$
Merino Short	—	5 $\frac{1}{2}$	5 $\frac{1}{2}$	—	4 $\frac{3}{4}$	4
Merino Cloth	—	6	5 $\frac{1}{2}$	5	5 $\frac{1}{4}$	4 $\frac{1}{2}$
Merino A. Comb.	7	6 $\frac{1}{2}$	6	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5
Merino B. Comb.	8	7 $\frac{1}{2}$	6 $\frac{3}{4}$	6 $\frac{1}{4}$	6 $\frac{1}{2}$	5 $\frac{3}{4}$
Merino C. Comb.	9	8 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{4}$	7 $\frac{1}{2}$	6 $\frac{1}{4}$
Fine Cross-bred Pelts ...	—	5 $\frac{1}{2}$	5	—	4 $\frac{1}{2}$	3 $\frac{3}{4}$
Cross-bred Short	7	6 $\frac{1}{2}$	6	5 $\frac{1}{2}$	5 $\frac{3}{4}$	4 $\frac{1}{2}$
Cross-bred A. Comb. ...	8	7 $\frac{1}{2}$	7	6 $\frac{1}{4}$	6 $\frac{3}{4}$	5 $\frac{1}{4}$
Cross-bred B. Comb. ...	9 $\frac{1}{4}$	8 $\frac{3}{4}$	8 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	6 $\frac{1}{2}$

In the above list, both the medium and coarse Cross-bred lines are omitted, but the reader will see how the price list is worked out. The prices given are about present values for each class of skin, but a buyer's list is frequently altered, as his limits are being constantly raised and lowered, which naturally causes the market to fluctuate in the same manner.

Lamb-skins are sold separately from the others. They are classed into fine and coarse, and long and short. Skins with bad cuts in the pelt are usually worth about 1d. per lb. less than a sound skin of the same quality.

Some sheep-skins have ribby marks on the pelt which cannot be removed, consequently they show in the tanned pelt. These ribby skins come off very wrinkly sheep, such as the Vermont breed, and are usually very heavy in condition, their value being fully 1d. per lb. under average skins.

Red sandy skins are of less value than other skins on account of the low yielding quality of the wool. Sometimes the sand works right through the wool and down on to the pelt in these skins; wherever the sand is touching the pelt it leaves a dark mark on the opposite side of it. The pelts are usually very thin and do not make good leather. Skins which have been taken off poor or diseased sheep have wool which, if given a slight pull,

will leave the pelt, while others have a very bad break in the wool. Skins of this class are classed as damaged, and also any skins containing very heavy burr. Dead skins are skins which have been taken off sheep that have died in the paddocks. They are easily detected, as the veins in the pelt are full of dried blood, through the sheep not having been bled at all. These dead skins usually bring about 1d. to 1½d. per lb. under the price of a sound skin of the same quality.

Weevils destroy the pelts of a great number of skins in the country. One has to examine a pelt very closely sometimes to detect the small holes made by the weevils, though if left long enough they will eat the whole pelt away. If skins are to be left for any length of time they should be painted with an arsenic solution, which can be purchased from most wool-brokers.

The following can be made up by any one wishing to make their own painting solution :—

½ lb. arsenic, ¾ lb. washing soda, 1 gallon of water, and boil well. This mixture can be added to 3 gallons more water, and painted on the fleshy side of skins with an old broom.

Green skins direct from the abattoirs are regularly sold in town by auction at so much each.

The skins are weighed by the broker, who gives the buyers the average weight per skin of each lot offered. The buyer then estimates the amount of weight the skins will each lose during drying. For instance, we will take a lot of green skins, the weight averaging 12 lb. each. The buyer values them at 6d. per lb. dry weight. He then estimates their loss per skin at 4 lb. This leaves him 8 lb. of dry weight per skin at 6d. per lb. The skins are therefore worth 4s. each. Green skins will lose from 25 to 35 per cent. of their weight when dried.

SKIN-BUYING IN THE COUNTRY.

Skin-buyers in country districts buy their skins from the farmers and send them to town brokers to be sold, usually at a profit. In most cases they have to buy very mixed lots from

the farmers, who know the value of skins almost as well as the dealer ; they do not get them for next to nothing, as many people suppose.

Some dealers buy at random. They know a full-woolled skin, also a pelt, but they have very little knowledge of wool qualities, or the methods of detecting dead and damaged skins, which I have explained in the previous chapter.

To be successful, a dealer must know just about what he will get for a skin in town, otherwise he does not know what to pay, and unless he has very good sellers to buy from, who let him make a good profit, this margin protecting him, he is certain to lose money on a good many of his transactions. Dampness in skins is one thing that causes loss in weight.

A dealer should thoroughly examine the skins, and if they are damp in any way, or have trotters attached, he should make allowance for the moisture, and see that no trotters are cut off.

A large number of dealers buy the skins from the farmers at so much each. In buying a mixed lot of skins in this way, the dealer should first class them out into small lots, such as pelts, $\frac{1}{2}$ -wools, etc. He can then arrive at their value more easily, as it is only guess-work buying a mixed lot of sheep-skins at so much each without classing them out.

In valuing, he must make an allowance for railway freights, and, if selling through a broker, commission charges as well. Most wool-brokers, town buyers, and shippers send price-lists to their regular clients showing the returns of skins at their last sale. They usually give a list showing the prices for what they call $\frac{1}{4}$ -wools, $\frac{1}{2}$ -wools, $\frac{3}{4}$ -wools, etc. Now a large number of dealers do not know how to distinguish a $\frac{1}{4}$ -woolled skin from a pelt, as they do not know where one ends and the other commences. For their benefit I will give the lengths of each sort as named by the leading brokers :—

MERINO PELTS.—Skins with wool $\frac{1}{2}$ in. long and under.

MERINO $\frac{1}{4}$ -WOOLS.—Skins with wool $\frac{1}{2}$ in. to $1\frac{1}{2}$ in. long.

MERINO $\frac{1}{2}$ -WOOLS.—Skins with wool $1\frac{1}{2}$ in. to 2 in. long.

MERINO $\frac{3}{4}$ -WOOLS.—Skins with wool 2 in. to $2\frac{1}{2}$ in. long.

MERINO FULL WOOLS.—Skins with wool over $2\frac{1}{2}$ in. in length.

In Cross-bred skins the lengths are slightly different.

CROSS-BRED PELTS.—Skins with wool up to 1 in. in length.

CROSS-BRED $\frac{1}{4}$ -WOOLS.—Skins with wool from 1 in. to 2 in. in length.

CROSS-BRED $\frac{1}{2}$ -WOOLS.—Skins with wool from 2 in. to $2\frac{1}{2}$ in. in length.

CROSS-BRED $\frac{3}{4}$ -WOOLS.—Skins with wool from $2\frac{1}{2}$ in. to $3\frac{1}{2}$ in. in length.

CROSS-BRED FULL.—Skins with wool over $3\frac{1}{2}$ in. in length.

Cross-bred skins are classed for sale in fine, medium, and coarse qualities. The daily newspapers quote the prices every week for the above classes of skins, so the dealer can very easily ascertain what price each quality is bringing at the auction sales.

Skins are usually consigned in bundles. These should be labelled with owner's name and address. The bundle should be securely fastened, and no damp skins packed in it, as a damp skin will sweat and damage the skins nearest it. A large number of consignments of skins are lost annually through insecure fastening of bundles and not attaching a tag with owner's name written plainly on it.

CHAPTER XIX

FARMERS' PRODUCE

Instructing farmers in the best methods of preparing for market their hides, calf-skins, fox-skins, and rabbit-skins.

A FEW lines instructing farmers on the best methods of preparing a market for their hides, calf-skins, rabbit-skins, etc., will be found useful.

We will first take hides. All hides are trimmed and swept free of all salt, etc., before being offered for sale by public auction. Most of the extremities are removed, the legs cut off just above the hock on the hind-legs, and above the knees on the front, so that the "pockets" in the hide will be removed, thus enabling the tanner to roll the hide out smoothly when tanned. The tail is cut off, also the forehead, lips, and udder, if any. (See diagram.)

The selling brokers have to allow the buyers "tare," usually 4 per cent., though in Queensland they have to allow 6 per cent., or say 2 lb., and 3 lb., weight on a 50-lb. hide.

Hides consigned to town for sale are opened out and trimmed by the brokers, and any salt or foreign matter is shaken from them. They are then weighed and lotted into their various qualities and weights. Trouble is often caused between consignors and brokers owing to the difference between the invoice weight and the weight originally consigned.

In dry weather a hide will lose 4 or 5 lb. weight during a short railway journey, especially if it is half green or sloppy. The shaking it gets in the trucks causes the water to run from it

freely. Some hides have 9 or 10 lb. of offal on them, which the selling broker has to remove, so he can only account to his client for the weight of a clean trimmed hide, less the usual

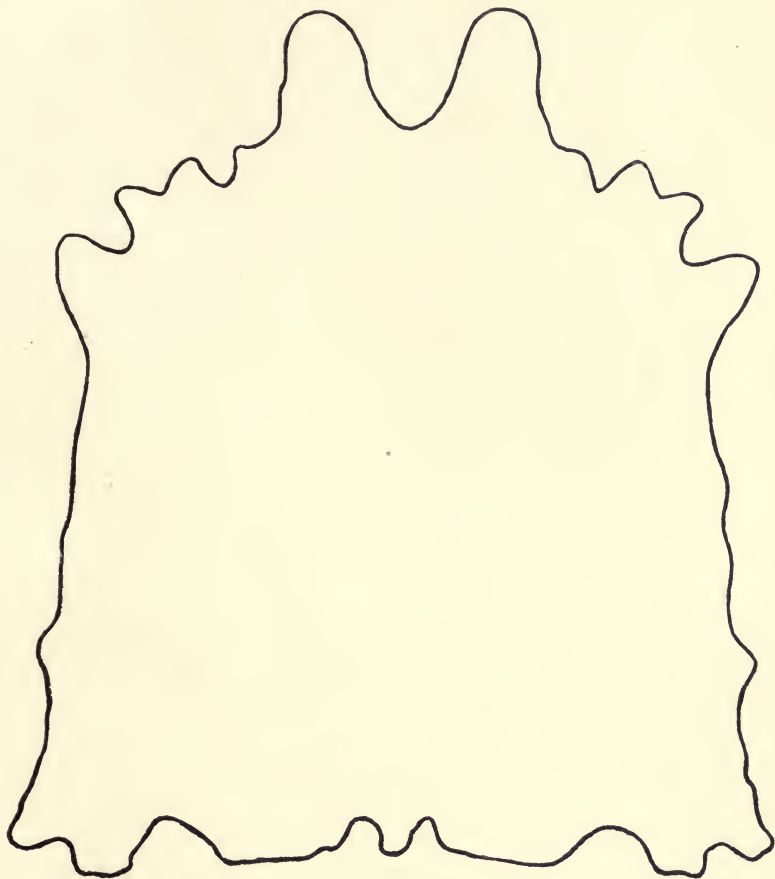


DIAGRAM OF CORRECTLY TRIMMED HIDE.

trade "tare," which is in a good many instances considerably less than the weight the farmer or butcher has consigned.

Green hides are hides that have not been salted at all. They are sent to town just as they come off the beast. Green hides begin to decompose if left any length of time without salting.

This damages the grain of the leather and lowers the value of the hide. Green hides are worth from $\frac{3}{4}$ d. to $\frac{1}{2}$ d. per lb. less than the price of well-salted hides.

Sloppy hides are those which have been insufficiently salted, enough salt only being used to cause a liquor to run from the hide, rendering it soft and wet. Sloppy hides are worth from $\frac{1}{2}$ d. to 1d. per lb. under the price of a good-conditioned or well-salted hide.

Half-green hides are those which have been salted but have not been allowed to lie long enough.

Good-conditioned hides are those that have been well salted and left till all the superfluous moisture has drained and evaporated from them. These hides will keep for any reasonable length of time, as the salt combined with the moisture the hide contains makes a brine which cures the hide thoroughly.

Hides are bought on quality as well as on condition and weight.

The following is a list of the weights into which the hides are classed by most of the selling brokers.

LIGHT CALF.—Calf-skins up to 10 lb. in weight.

HEAVY CALF OR YEARLINGS.—Calf-skins over 10 lb. in weight and up to 20 lb. inclusive.

KIP.—A hide from 25 to 40 lb. in weight.

LIGHT HIDE.—A hide from 40 to 45 lb. in weight.

MEDIUM HIDES.—Medium hides weigh from 45 to 55 lb. in weight.

HEAVIES.—All hides over 55 lb. in weight.

Great care should be taken when skinning a beast, because if the hide is cut or scored it lowers its value considerably. The hide should be cleansed of any blood adhering to it by washing with water if necessary, and at once salting down. The first hide should be spread out flesh side up, either slightly elevated in the centre or on a slight incline to admit of free drainage away of the moisture, and then well salted with coarse salt, being sure to see that the points are well treated in this respect.

The second hide is laid *flesh downwards* exactly on top of

the bottom hide, head to head, and point to point. A few handfuls of salt should be spread over the hairy side before placing the third hide hair *down* on the second, and so on.

From seven to ten days should be sufficient to cure hides in this way.

When preparing for dispatch, leave some salt in each hide and fold in two right down the back, flesh to flesh. Next turn the belly edges together over towards the back and fold, first the head and then the tail towards the centre, finally folding into one compact parcel. In this way any dirt or blood on the hair cannot possibly come in contact with the flesh side and so discolour it.

All that remains to be done is to tie the hide with wire or binder twine, attach a label correctly addressed to the broker and bearing the sender's name on it as well. Such labels are usually supplied by the broker on application.

Many consignors are somewhat careless over this important proceeding of correctly labelling packets consigned, and consequently the losses in transit and through wrongful delivery are considerable.

FOX-SKINS.

Fox-skins are often sent to town for sale, with the brush not split open. Very often the pelt sweats and the fur comes out. The brush should be split right down to the end and tacked out so that the air can get at it and dry it like the rest of the pelt.

A system of classing is adopted in these, as in other skins placed on the market for sale, due regard being paid to the size of the skin, the quality of the hair, and also to that important feature, the "brush," those with the brush split open being worth considerably more than those not so treated.

To prepare them for market, the skins should be pegged out—but not over-stretched—in a shady place, till the flesh side of the skin has a nice even-coloured "crust" on it. Any fat should be removed. The ears and head of the skin should be left

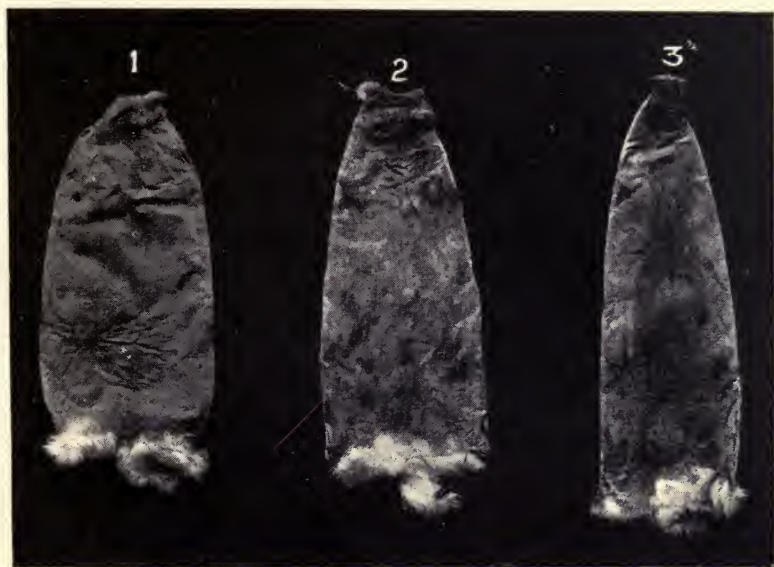
on. In packing in parcels for forwarding, place hair to hair, and pelt to pelt, to keep the hair from becoming in any way damaged by grease. Good silver fox-skins are very valuable, selling at present up as high as 120s. to 130s. per dozen.

RABBIT-SKINS.

Most country boys take an interest in attending to furred skins such as rabbits, foxes, etc. A large number of men are also employed in Australia trapping rabbits, and as the skins are very valuable, a little information as to the best methods of preparing them for market and how to distinguish the different sorts will be found useful. The best way for a trapper to take the skin off is to slit the pelt down the inside of the hind legs and pull the skin back over the head just as if you were turning your coat-sleeve inside out. Skins taken off in this manner are called sleeve skins and they are worth more than those taken off in other ways.

When drying rabbit-skins a wire should be bent, so that it resembles a large hairpin. The wire is held together at the ends and inserted up the inside of the skin; one wire running up the centre of the back, the other along the centre of the belly. Skins dried in this way do not expose any of their fur to the grease and dust of the other skins. "Slipper" skins is the name given to those skins with the pelt cut in the centre of the belly portion of the skin; most skins from freezing works are taken off in this manner. Fur on these skins is exposed to dirty and greasy pelts of the other skins. When the carcase of the rabbit is of commercial value the skin has to be out, so that the inside can be removed. Slipper skins, so named because of their resemblance to a slipper, are worth from 3d. to 4d. per lb. less than sleeve skins of the same class. Rabbit-skins vary in price according to the quality. A few of them are used by the furriers, but the bulk of them are used by the hat manufacturers, who buy the skin solely for the fur it contains, the pelt being cut into pieces by the machinery during the

removal of the fur ; that is why the light-pelted skins are worth more than the heavy. The fur on the rabbit-skin does not show on the outside ; it is covered by coarse, hairy fibres which grow over it. If you blow the hairy fibres aside, the soft, slaty-coloured fur can be seen. The coarse, hairy fibres are not used in the manufacture of hats, as they possess no felting qualities. Winter skins contain most fur and therefore are the most valuable. There



[Photo by Author.]

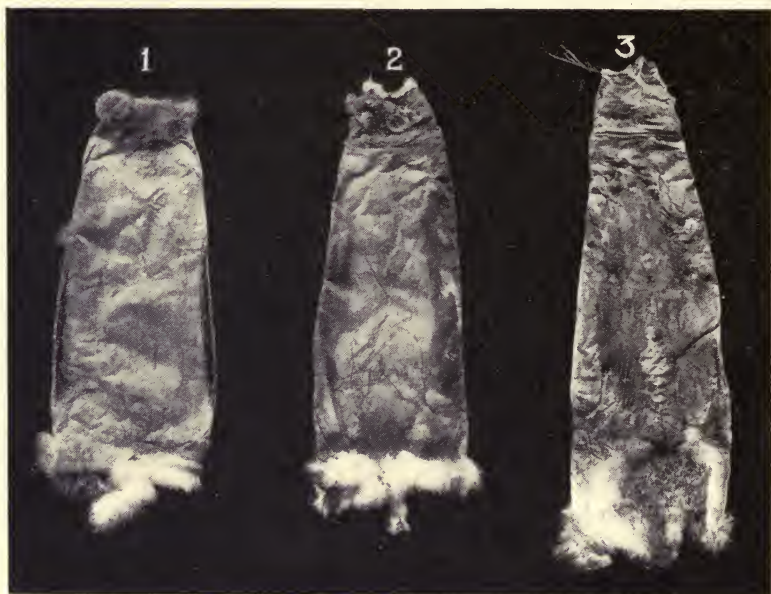
RABBIT-SKINS.

1. First winter skin, pelt all white.
2. Second winter skin, black spots on pelt.
3. Second summer skin, image of rabbit sitting up, in black on pelt.

are several qualities of winter skins, but I will deal with the principal sorts. These are first winter, second winter, and "incoming" skins.

The first winter skins consist of those that have an all-white pelt, second winter skins have black spots all over the pelt. (See diagram.) Where there is a black spot on the pelt the fur on the opposite side is not full grown ; this can be detected by blow-

ing the fur apart at the exact place where the dark spot is on the pelt, and the difference in the length of the fur will be seen at once. The dark spots on the pelt do not have any effect on the hairy fibres which grow over the fur. All rabbit-skins are sorted by the marks on the pelt, because each different class of skin has marks there that denote the quantity of fur it



[Photo by Author.]

RABBIT-SKINS.

1. First incoming skin, showing a little dark on sides of pelt.
2. Second incoming skin, showing heavier and deeper dark on side of pelt.
3. Milky doe, showing yellow and dried milk veins on belly of skin.

possesses. First summer skins have an all-white pelt, and an inexperienced person might mistake them for a first winter. They can, however, easily be detected from the first winters by the shortness of the hair and fur ; the pelt is also a rather dirty white, the pelt of the first winters being cleaner-looking. Second summer skins have a dark image on the back of the pelt which resembles a rabbit sitting up. (See illustration.)

There are also first and second "incoming" skins. The former resemble the first winter skins, only they have a little black on the sides which is just going off the pelt ; when it does leave, the skin will be a first winter. (See illustration.) Second incoming skins have black marks on the side and top of the pelt. The inside edge of the black marks on the pelt form the shape of a sitting rabbit, though the image in this case is coloured white, not black, as is the case with second summer skins. "Kittens" is the name given to skins off small and young rabbits. Milky does, as the skins off breeding rabbits are called, are detected by two large brown raised marks on the belly portion of the rabbit-skin, these marks being caused by the dried milk veins.

If the trapper classes or sorts his skins into the sorts I have named, he will be able to tell the value of each lot, as the price-lists of the buyers of skins will show him what each sort is worth per lb.



CORRECT POSITION FOR CUTTING THROAT.

[Photo by Author.]



OPENING UP FRONT OF SHEEP.

[Photo by Author.]

CHAPTER XX

KILLING, SKINNING, AND DRESSING A SHEEP

Correct method of killing and taking off the skin.

THE sheep is held in position and the throat cut straight across, almost severing the head. The sheep is then bled for a minute or two. To remove the skin, take the left fore-leg between the knees, and strip up the front of it towards trotter for 4 or 5



[Photo by Author.]

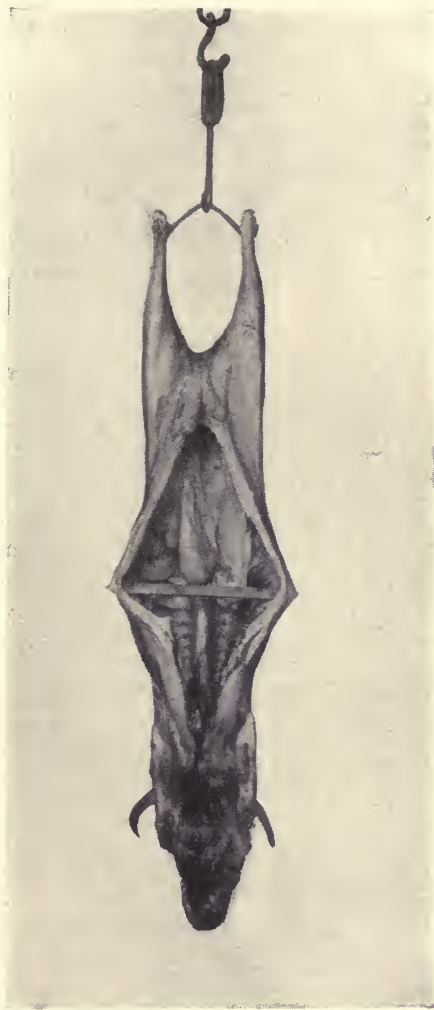
OPENING UP BACK OF SHEEP.

inches ; then put the knife in at the end of the first cut, and cut right down the front of the leg, continuing up the centre of the neck if possible. This will open the skin up. Then strip the skin down over the left shoulder. The right fore-leg is treated in the same manner as the left, the knife being driven across, so



[Photo by Author.]

SKIN PARTLY PUNCHED OUT.



[Photo by Author.]

CARCASE READY FOR MARKET.

that it will meet the cut from the other fore-leg in the centre of the neck. Then catch hold of the skin on the brisket and pull it up or back—this will clear the brisket.

The whisel is then pulled out and a knot tied in it, and the skin stripped down over the shoulder in a similar way to the other fore-leg. The trotters are then cut at the joints. The hind-legs are next treated, starting on the right leg, this being on the same side as the last fore-leg treated, as a butcher always works right around the sheep, finishing on the same side as he began. The hind-legs are opened up by slitting down the inside of each, the cuts meeting in the centre of crutch, and the skin is opened up, care being taken to work the skin well over towards the back. The sheep is now hung up and the skin is split straight down the centre, and each side worked out with the knife over the flanks. It is then punched out to the centre of the back on the left side.

The skin is then held up by the britch end and pulled right off, taking care to pull the skin upwards by letting the carcase swing towards you, and not straight downwards, as it is liable to tear the carcase. The sheep is now opened right down the centre with a downward cut commencing near the crutch and running right through the brisket and neck.

The entrails are removed first, then the liver, etc., and the inside of sheep washed out with clean water, and a stick inserted.

TERMS AND MEANINGS

- Alpaca.**—A small animal somewhat resembling a goat. It grows a long, fine wool about 50's quality, the colours being mostly black and grey. It is a native of South America.
- Anthrax.**—A deadly disease which attacks sheep, causing death in a few hours. Wool-sorters and others occasionally get this disease through handling wools and hairs from infected animals.
- Back-country.**—Name given to country in Australia situated far from towns and railway termini. Most large sheep-runs are in the back-country.
- Backwasher.**—A machine used for washing tops, etc., to remove all impurities, It also dries the tops after washing by passing them over steam-heated cylinders or perforated cylinders through which hot air is forced.
- Bale.**—To facilitate its handling, wool is pressed into bales of about 350 lb. weight each, by means of a wool press. Bales are still further pressed before shipping by means of a hydraulic dumping press.
- Basil.**—A tanned sheep-skin pelt. The pelts are tanned after the wool is removed. Basils are used for cheap boots, gloves, and other articles for which a cheap, light leather is required.
- Bellies.**—Wool shorn from belly of sheep. Belly wool is packed separately from the fleece wool.
- Botany.**—The name originally given to wools shipped from Botany Bay, near Sydney, New South Wales, but the trade now call any fine Merino wool "Botany."
- Bradford.**—Large English wool-manufacturing town.
- Break.**—Referring to a break in the wool caused by sheep being on good and bad country alternatively; when sheep are having a bad time through dry weather the wool practically stops growing, but shoots up quickly when rain comes, in most cases leaving a "break," or tender part, in the staple of the wool.
- Brush.**—Large bushy tail of the fox.
- Burring Machine.**—A machine used by fellmongers for removing burrs and other vegetable matter from the wool on sheep-skins.
- Burry Wool.**—Wool containing burrs, seeds, and other vegetable matter.
- Carbonizing.**—The removal of burrs from wool by immersion in weak solution of sulphuric acid.
- Cast Sort.**—A lot of wool consisting of odd fleeces and sorts that cannot be made into lines on account of the small quantity of each.

- Canary Stain.**—A light yellow stain found in some Queensland wools which cannot be washed out.
- Cashmere.**—Very fine downy wool from Cashmere goat. The name "cashmere" is also given to stockings and other fine light Merino wool goods.
- Character.**—Term used to define well-grown wools that possess a very even crimp.
- Charcoal-stained Wool.**—Sheep on country which has been swept by a bush fire get their wool discoloured by the charcoal on the burnt stumps.
- Clothing Wool.**—Meaning a short Merino wool. A few years back this wool could not be combed economically, but it is now combed as easily as the longer wool.
- Combed in Oil.**—English wool-combers work about 2 per cent. of oil in with their tops when combing to prevent friction between the wool and the combing machinery.
- Combing Wool.**—Wool having a staple not less than $1\frac{1}{2}$ inches for Merino and $2\frac{1}{2}$ inches for Cross-bred.
- Comeback.**—A fine Cross-bred wool of 58's and 56's quality obtained by using a Merino sire on Cross-bred sheep, thus making the wool "come back" to the Merino side again.
- Condenser.**—A carding machine which cuts the wool into small strips ready for spinning.
- Condition.**—Referring to the state of wool. Wool containing a lot of yolk and foreign matter is called heavy-conditioned, while light and bright wools are called light-conditioned.
- Conditioning Wool.**—Testing either greasy, scoured wool, or tops, to ascertain what percentage of moisture they contain.
- Consignor.**—Person who sends or consigns wool or other merchandize from one place to another.
- Cotted Wool.**—Cross-bred wool frequently becomes cotted through fibres felting together, and has to be torn apart by machinery. Merino wools seldom become cotted except portion of the neck wool and that under the jaws of the sheep.
- Cross-bred.**—Cross-bred sheep are the progeny of two distinct breeds of sheep such as are produced by mating a Lincoln ram and Merino ewe.
- Crutchings.**—Wool shorn off britch of sheep some time before shearing, in order to keep sheep clean, and to prevent maggot fly from attacking them.
- Culling.**—Station term meaning the rejection of inferior sheep, which are called "culls."
- Dags.**—Hard lumps of sheep dung which are encircled round the wool staples on britch end of sheep.
- Dead Wool.**—Wool removed from dead sheep; thousands of bales of dead wool were sold in Australia last season, 1912-13, on account of the dry spell.
- Dew-lap.**—Hanging folds under jaw and neck of sheep.
- Dingy.**—Yellow and discoloured wool, usually very heavy in condition.

- Draft.**—Wool-buyers are allowed 1 lb. "draft," or allowance, by brokers in every hundredweight of wool they purchase. One of the processes in the reducing of tops to spun yarn is also called "Draft."
- Drafting.**—Separating two or more kinds of sheep, usually done at a gate at junction of races leading into different yards, the shutting of the gate closing one race and leaving the other open and *vice versa*.
- Dry Combing.**—Combing tops without the addition of oil; most Continental top makers comb their tops dry. Dry-combed tops take the dye better than those combed with oil.
- Fadges.**—Australian wool-brokers call any bale or parcel of wool under 200 lb. in weight, and which is too large to be called a sack, a fadge.
- Fellmonger.**—Name given to person who removes the wool from, and tans the pelt of, sheep-skins.
- Felting Property.**—Possessed by some wools more than others, meaning the interlocking of the fibres together, the scales of one fibre fitting into those of another as seen in billiard cloths, felt hats, etc.
- Fleece.**—The best and bulk of the wool which hangs together when shorn from sheep.
- Fribby.**—Short locky pieces of wool such as second cuts and small black yolky locks from crutch and under fore-legs of sheep.
- Greasy Wool.**—Description given to raw wool that is in same condition as when shorn from sheep that have not been washed or cleansed in any way.
- Green Skins.**—Description given to sheep-skins fresh from the slaughter-house. Fellmongers prefer green skins, as they can be worked much faster and cheaper than skins which have been dried.
- Gummy.**—A description given to scoured wool with a large quantity of the yolk left in it.
- Half Green.**—Description given to hides that have been insufficiently salted.
- Interlotting.**—Lotting together wool of same money value and quality but belonging to several different owners, thus making one large lot of several small lots.
- Kiln.**—Apparatus for drying wool, usually a fine wire-netting table through which hot air is forced from underneath.
- Limit.**—The extreme price that a wool-buyer or merchant can pay when buying wool or other produce.
- Lincoln.**—A breed of English long-woolled sheep growing coarse heavy fleeces of 36's and 40's quality. This breed is used largely in Australia for crossing with the Merino.
- Liquor.**—Solution used for scouring wool, made up of hot water and soap.
- Llama.**—A South American animal, a beast of burden and wool-grower combined.
- Locks.**—Consisting of all very short pieces of wool unsuitable for combing, such as second cuts and all the small pieces that fall from sheep during shearing.
- Long-wools.**—Name given to British breeds of sheep growing long coarse wool such as Lincoln, Cotswold, Leicester, etc.

- Merino.**—Originally a Spanish breed of sheep noted for their very fine wool ; about 70 per cent. of the sheep in Australia are Merino.
- Mohair.**—Hair from the Angora goat. Mohair has great lustre and somewhat resembles very bright Leicester wool.
- Mother Hair.**—Long white kempy fibres found in lambs' wool ; these hairs disappear from the wool as the lamb grows older.
- Mushy Wool.**—Wool without any regular staple. The fleece coming off more in form of spider's web, usually from old sheep in bad seasons. Mushy wool would give a poor return of top and a large quantity of noil.
- Noil.**—Consists of all short and broken fibres removed from wool during combing process.
- Offal.**—Useless portions of hides trimmed off before sale, such as ears, legs, and other extremities.
- Pelt.**—Sheep-skin with very little or no wool on it. Name given to sheep-skins after the wool has been taken off them by the fellmonger.
- Piece-pickers.**—Men employed on stations at shearing time to pick or sort the pieces into the sorts named above.
- Pieces.**—Name given to all wool skirted or pulled from the fleece. On sheep-stations three sorts of pieces are usually made, viz.:—first pieces, second pieces, and stained pieces.
- Pockets.**—Hollow portions of hide such as that off knee and part of hind-leg.
- Potsticking.**—Method of scouring wool by hand, mostly used by small country wool-sourers and stations that do not have enough scouring to employ a machine profitably.
- Pullers.**—Men employed by fellmongers to pull the wool off sheep-skins and at the same time sort it into its various grades and qualities.
- Quality.**—Referring to the fineness or coarseness of wool.
- Re-classing.**—Mixed wools sent to town for sale are often classed by wool-brokers to enable them to sell it to better advantage.
- Red Wool.**—Wool grown on red soil country such as western New South Wales and north-western Victoria. The wool has a light red colour through dust adhering to it.
- Ribby Pelts.**—Pelts off very wrinkly sheep such as the American Vermont. The ridges or wrinkles cannot be removed from the pelt, consequently they show in the leather, thus lessening the value of it.
- Roped.**—Term used to describe wool that has become tangled and knotted during scouring process by an unskilful operator.
- Scored.**—Description applied to hide marked by careless use of the knife when skinning beast, but not cut right through.
- Scoured Wool.**—Wool that has been washed or scoured, thus removing most of the impurities.
- Shafty Wool.**—Term used to define a well-grown bold-stapled wool.
- Shank.**—Name given to short hairy wool growing on bottom of sheep's legs.
- Shearer.**—Person who cuts or shears wool off sheep. A good shearer will shear from 150 to 200 sheep a day.

- Shearing.**—The annual removal of the wool from the sheep by the shearers. Shearing is the most important event of the year on sheep-stations.
- Shed Hands.**—Men employed at shearing time to take wool away from shearers, pen up sheep, etc. They are also called "rouseabouts."
- Sheep-classing.**—The selection of the best sheep for breeding purposes, and rejection of inferior and other sheep that differ from the desired type.
- Shoddy Wool.**—The product obtained from torn-up worsted and long-fibred rags. It is made up again into various types of fabrics.
- Shorn Wool.**—Wool shorn from sheep in usual manner. Wool from sheep-skins, dead wool, etc., would not be called shorn wool.
- Short-woolled Sheep.**—British breeds of sheep growing short, fine wool such as the Shropshire, Southdown, etc.
- 60's.**—Meaning a wool of a certain quality. 60's is the quality of average Merino wool, and means that 1 lb. of 60's quality top will spin 60 hanks of yarn, each 560 yards long ; 50's will spin only 50 hanks, etc.
- Slipe Wool.**—Wool removed from sheep-skins by fellmongers.
- Sloppy Hide.**—Description given to a hide which has not had much salt and is in a very wet and sloppy condition.
- Spinner.**—Person who spins scoured wool or tops into yarns ready for weaving.
- Squatter.**—Name given to early sheep farmers who first took up virgin country in Australia.
- Stained Wool.**—Wool on britch of sheep stained by dung and urine. This wool cannot be washed white, and is therefore used for manufacturing dark goods only.
- Staple.**—Small bunch of wool fibres which hang together ; wool grows in staples.
- Star Lot.**—Small lot of wool consisting of three bales and under in Victoria, five bales and under in New South Wales and Queensland. Star lots are sold in a different room from other lots, so that large buyers are not kept waiting while small lots are sold.
- Station.**—Large sheep farms are called sheep stations in Australia.
- Sticky Neck.**—The neck wool of sheep grazing on scrubby country gets full of sticks, etc., owing to sheep forcing their way through bushes.
- Sulphide of Sodium.**—Chemical used for loosening the wool on sheep-skins prior to fellmongering them.
- Sweating.**—Method employed by fellmongers to remove the wool from sheep-skins. The skins are hung up in a closed chamber till the pores of the pelt swell, thus loosening the wool.
- Tar Brands.**—Sheep farmers sometimes brand their sheep with tar ; this ruins the wool. The best way to remove them is to clip the tops of the brands from the wool, as they cannot be washed out.
- Tare.**—Allowance made to buyer to compensate him for weight of wool-packs. The buyer pays for the net weight of the wool only, less "Draft."

- Tender.**—Description given to wool that will break at a certain part of the fibres when subjected to any light strain. Tender wools give a larger percentage of noil than sound wools.
- Tick.**—A small parasite about size of housefly which eats into skin of sheep making it poor in condition, also discolouring and reducing the density of the wool.
- Top-knot.**—The short fuzzy wool growing on top of sheep's head.
- Tops.**—Consisting of partially manufactured wool, which has been scoured and then combed, the combing resulting in top and noil, the former consisting of all the long straightened-out fibres suitable for worsted yarns.
- Trotters.**—Sheep's feet, very often left on sheep-skins by butchers.
- Twaddle.**—Instrument used for measuring the strength of acid solutions.
- Twist.**—The amount of turns or twist given to wool when spinning it into yarn. Some materials require a tightly twisted yarn, while others, such as flannels, blankets, etc., do not require so much.
- Two-tooth.**—Name given to twelve months old sheep. Sheep usually get two teeth every twelve months up to three years; they are then known as old or full-mouthed sheep. A four-tooth would be two years old.
- Unskirted.**—Wool sent to town without any preparation whatever, having been placed in the bales just as it comes off the sheep.
- Vermont.**—A very wrinkly breed of Merino sheep growing a heavy fleece of very heavy-conditioned and black-tipped wool. Vermont Merinoes were originally imported from America.
- Warp.**—The threads or yarn in a cloth which run longways. Warp threads are spun from sound-stapled wool.
- Weevils.**—Small grub-like worm which destroys the pelts of sheep and other skins. Skins should be painted with an arsenic solution to prevent this.
- Weft.**—The threads or yarn in a cloth which runs across, or at right angles to the warp. Weft yarns are mostly spun from tender wools, and in some cases are just strong enough to stand the strain of weaving.
- Wethers.**—Male sheep which have been castrated when lambs.
- Williams' Boxes.**—Apparatus for washing the dirt out of wool after it has been soaked in the hot scouring liquor.
- Wisel.**—Wind-pipe of sheep.
- Wool-classer.**—Person employed on sheep-stations and elsewhere to class fleece into its various grades and qualities so that it can be offered for sale in even qualities.
- Woollens.**—Name given to type of goods such as blankets, flannels, rough tweeds, etc. Woollens are made from rough and uneven yarns which spread in the finishing process which woollens undergo, and hide the weave of the material altogether. Blankets when leaving the weaving loom look more like pieces of a woolpack than blankets, the "kind" and "soft" appearance being given to it by the finishing process.
- Wool-sorter.**—Man employed by manufacturers to sort fleece wool into its various qualities, the sorters making anything from six to ten sorts out of a fleece.

Worsted.—Consisting of finely smooth-woven materials, such as the fine twills used for men's wear. The weave can be plainly seen, each yarn showing up separately on the face of the fabric. Worsted goods are made up with very even yarns which are mostly spun from tops.

Yield.—Meaning the yield or quantity of clean scoured wool or top returned after scouring and the removal of all impurities.

Yolk.—The name given to the grease or natural fat contained in raw or greasy wool.

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